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## ORIGINAL ARTICLES.

### THE SIGNIFICANCE OF VARIATIONS IN THE INTERNAL SECRECTIONS.\*

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THE subject of internal secretions and organic extracts has been so thoroughly discussed during the last year or two that I fear I can offer nothing new, but will put into words a few of my as yet chaotic thoughts hoping that some one here may mold them into some tangible form.

Bacteriologists are convincing us that more and more diseases are bacterial in origin, and I find that my clippings of articles and abstracts are going more and more into the files reserved for diseases or disorders of nutrition. These two great divisions of disease, bacterial and nutritional, are ever growing larger.

Pathologists are teaching us to class many so-called diseases as simply disturbed conditions, and to me the problem now is are not the glands furnishing internal secretions the cause of many of these mal-conditions?

We then turn to the physiologist to teach us the exact functions of these glands, and to the experimental pharmacologist to tell us what action to expect from the administration of these glandular extracts. However, our knowledge from both of these sources is as yet insufficient to account for many mal-conditions or to account for many successful therapeutic uses of these glands. Hence we are still in the realm of surmise as to the mal-physiology of the ductless glands in disturbed conditions and are perhaps often justified in using these organic extracts empirically. It is my purpose to briefly state what we really know of the most important secretions and what we are perhaps justified in surmising.

The conditions that have been proved to be caused by disturbances of an internal secretion are acromegaly, cretinism, myxedema, Addison's disease, and about half of the cases of diabetes. The conditions that I would like to see proved as due to some disturbed internal secretion are, hysteria, neurasthenia, possibly melancholia in its first stages, hemophilia, rickets, atheroma, sclerosis, gout, leucemia, chlorosis, shock, what we call a neurotic condition, and all cases of diabetes.

During this discussion, to-night, I shall leave out of consideration the various digestive juices and consider only those of the most important ductless glands.

We now pretty well understand the function

of the thyroid, we know considerable of the suprarenal glands and the pituitary body, we know a little of the thymus, testicle, ovaries, mammary, and parotid glands, and considerable of the pancreas and spleen.

We may take up the action of the thyroid and suprarenals together, as in many ways they are diametrically opposed. The thyroid is perhaps the main organ of the body to furnish vasodilating material, while the suprarenal glands are without doubt the main organs of the body to furnish vasoconstricting stuff. Hypersecretion of the thyroid or the feeding of thyroid substance will always dilate the peripheral blood vessels and reduce arterial tension. On the other hand, the blood-pressure raising power of suprarenal extract is without equal in pharmacology.

Physiologists have never yet proved a center in the brain for the regulation of heat, and many believe that the vasomotor center in the medulla is sufficient to explain this normal regulation of heat production and heat loss. What part these two glands play in this alternating opening and shutting of the blood vessels of course we do not know, but the babe has but an imperfectly developed thyroid, and its adrenals have been observed to contain no vasoconstricting stuff, and we know that the temperature in the very young varies with the temperature of its surroundings, it having no heat governor or regulator.

The thyroid gland seems to be the one that has the most to do with the health of the skin, keeping it soft and pliable, and causing the normal amount of insensible perspiration. If this gland becomes atrophied or enlarged by connective-tissue elements displacing its normal parenchyma, the skin becomes harsh and dry, and if the condition is sufficiently aggravated, mucin appears in the tissues and the condition of mucous edema or myxedema is present.

Normally the thyroid gland begins to atrophy from forty-five to fifty years of age. The advent of old age allows, sooner or later, the skin to become dry, harsh, rough, and perhaps shrivel or wrinkle. In the condition of the skin just mentioned in old age and where there have been scaly eczemas due to dryness of the skin I have found thyroid to be one of the best treatments.

Diminished secretions of the thyroid allow the blood tension to become higher, hence the old adage that we are always and only as old as our arteries seems to be proved very true. Undersecretion of the thyroid gland tends to allow, I do not say cause, an endarteritis which later may lead to true atheroma. Hence the normal stiffening of the arteries that occurs as age comes on is simply physiological, due to the undersecretion of the thyroid, and if not actually to the oversecretion of the suprarenals, at least to the over rela-

\* Read at the meeting of the Medical Association of the Greater City of New York, held at the New York Academy of Medicine, December 8, 1902.

tive secretion of the vasocontracting stuff. From these two reasons the arteries harden and the blood tension becomes high. That some of these conditions may occur in life is only because any of these glandular secretions may undersecrete or oversecrete at any time, due to various causes, and I believe that the so-called alterative drugs of which we have a large class have such so-called alterative action because they act upon one or more of the ductless glands modifying their secretion.

Perhaps the reason that syphilitics have so much tendency to sclerosis and endarteritis is that mercury long given may interfere with the action of the thyroid gland. I think that probably underaction of the thyroid also allows connective-tissue growth in many of the organs of the body. In other words, it allows sclerosis and I believe that the feeding of thyroid in small doses is one of our best treatments to prevent the advance or at least to slow up this connective tissue formation. Also in cases of arteriosclerosis where nitroglycerin in small doses is of value to reduce the disturbances from high tension, such as dizziness, sleeplessness, headache, and possibly asthma, I have found thyroid of marked benefit. The iodides that have been so much used to meet all of these conditions just mentioned have been proved to be stimulant to the thyroid secretion.

To take up the opposite condition from the above, namely that of shock, we have, whether due to pain, severe acute or prolonged subacute, to severe injury or to operations even without loss of blood, from each cause the same pathology, viz., very low blood pressure and dilated or even paralyzed vessels. In the meantime, of course, the body is losing the heat, which is so necessary to life from the dilated peripheral vessels. Whether severe pain has caused an enormous secretion of the thyroid, or what is more probable, temporarily paralyzed the adrenals, or both, we do not know. When such shock follows laparotomy whether from splanchnic plexus injury or from the necessary manipulations disturbing the adrenal glands, certain it is that the most prominent indication is for something that will contract the blood vessels, and many times no drug in all our armamentarium is capable of carrying on the fight to a successful termination. I believe that to meet this condition we have in suprarenal, or adrenalin chloride, or suprarenalin solutions the very agents we desire. Suprarenalin is Armour's selling name for Abel's epinephrin.

The action of this substance in raising the blood pressure is immediate, but unfortunately does not last but a part of a minute. In treating shock it will probably be found best to inject a solution drop by drop into a vein timing the rapidity by the behavior of the pulse. The solution should be one part to a thousand of suprarenalin, where each drop represents .00005 of a gram. Adrenalin chloride solution is active and is acid. Any of these preparations of suprarenal can be

given on the tongue for absorption there, but unfortunately it has been proved that when taken into the stomach the blood-pressure raising power of suprarenal is absolutely lost.

Suprarenal is also a strong cardiac stimulant as well as a vasomotor contractor. Reichert, of Philadelphia, has recently shown that in profound morphine narcosis the adrenal secretion is stopped. This explains some of the symptoms of the last stage of opium poisoning and shows the danger from loss of heat in these cases and suggests suprarenal treatment.

Now, turning to the nervous element in thyroid secretion we find that it is a marked cerebral stimulant causing wakefulness, acuteness, rapidity of thought, and general brain activity, all of which occur so frequently and so generally in our neurotic patients. If this secretion is greatly exaggerated we have headache, brain irritability, and can even feed it to the point of causing convulsions. What is taking place in the brain in melancholia we do not know, but I have occasionally awakened the mental faculties in morbid conditions by thyroid.

In the vasomotor ataxia (Cohen's term) of neurasthenia it would seem as if the suprarenal glands might not be doing their work, which would give the low blood pressure, the lack of digestive power, the drowsiness due to anemia of the brain when the patient is up and the sleeplessness when the patient is lying down.

Now, what is the intangible cause of hysteria? We turn again to the thyroid gland, as we know this to normally, in women, hypersecrete with each menstrual epoch. Also, 80 per cent. of all cases of exophthalmic goiter, or, as I prefer to call it, Graves' thyroid disease, occur in women, and I believe this disease to be due to a hypersecretion of the thyroid, its symptoms being exactly those caused by the overfeeding of thyroid, viz., nervousness, restlessness, sleeplessness, palpitation, hot flashes, sweating, and increased irritability of the reflexes. On the other hand, 80 per cent. of all cases of myxedema also occur in women, and this is well known to be due to undersecretion of the thyroid. This hypersecretion of Graves' disease occurs mostly between twenty and forty years of age, in other words during the most active period of thyroid life in women. On the other hand, myxedema occurs almost invariably from forty-five to fifty-five years of age when the thyroid normally begins to atrophy. I wish to emphasize the fact that between these opposite points of profound hypersecretion and practical absence of secretion are all gradations of increased or diminished secretion, and many of the troublesome, unaccountable, intangible symptoms in women are due to this variation in thyroid secretion. The palpitations, the nervousness, the restlessness, the increased susceptibility to pain, and even possibly the misinterpretation of pain in conditions of hysteria I think can be due to misbehavior of this gland.

When the menopause takes place, if this gland,

which has normally been hypersecreting once a month, stops its work synchronously with the ovaries, we have the best possible advent of this changed condition. On the other hand, if this gland continues to secrete more than is needed for the organism, we have the hot flashes, the full-headedness, the palpitation, and the nervous phenomena so well known to us as the troubles due to the menopause. As a corollary to these last statements I have found that in delayed menstruation, with or without anemia, no drug is as efficient in causing normal menstruation as thyroid extract, given in three-grain doses three times a day. I have also many times found in feeding thyroid for other purposes that menorrhagia was caused.

We understand the condition of cretinism, but perhaps do not think that a diminished amount of normal thyroid secretion in the young child may be the cause of the fat, flabby skin, dull features, chronic eczemas, erosions and fissures, and perhaps enlarged glands of the neck. I have a number of times seen such cases do better on thyroid than on any other treatment, and the very alteratives which we sometimes give for this purpose and find valuable are those which increase the secretion of the thyroid gland, viz., arsenic, iodide of iron, the iodine of cod-liver oil, and potassium iodide.

The thyroid gland also regulates in some way the elimination of nitrogen in the urine, and we can feed thyroid to patients whether they are obese or not, and increase the nitrogenous output. On the other hand, at the time when the thyroid begins to normally diminish its secretion is the time when men and women begin to add weight. This is especially true of women after the menopause.

Diseased suprarenals give the cause of many of the symptoms in Addison's disease, notably the great diminution of vasomotor tension. Whether this gland has anything to do with the loss of red blood corpuscles in this disease we do not know, but the patient apparently dies of what might be considered an ultimate vasomotor paralysis.

The other functions of the suprarenal glands besides the blood-pressure raising power are still unknown, but it has been lately shown that they have something to do with the production of glycogen (Herter). We certainly do have cases of diabetes mellitus without any pancreatic or nervous disease. I have recently had such a case, and of many treatments tried, the urine being examined weekly, it was found that under the action of suprarenal substance swallowed we could diminish the output of glucose, cause the diacetic acid to disappear and greatly diminish the acetone and ammonia. In this same case thyroid feeding almost caused toxic acidemia. This boy went along very well on suprarenal feeding for nearly a year. For observation purposes the suprarenal was then stopped for two weeks. Post hoc, ergo propter hoc the patient at the end of that time

developed diabetic coma and died in a few days. It is also interesting to note that hyperthyroid feeding in Graves' thyroid disease can cause glycosuria.

I have long been suspicious of the suprarenals as having something to do with gout. Just what gout is I will let someone else answer, but with gouty joints, with high tension blood vessels, and in gouty asthmatic attacks I have found small doses of the opposite of suprarenal, viz., thyroid not only of considerable immediate benefit, but tending to cause all kinds of gouty attacks to become very much less frequent. This may be due partially to the action of thyroid on nitrogen elimination.

What the pituitary secretion means to the system is in a measure uncertain. It is probably always hypersecreting in the condition of gigantism, is certainly always diseased in acromegaly, and probably if every case of gigantism lives long enough he will assume the acromegalic type, gigantism being nearly homogenous overgrowth of bone, while acromegaly is irregular bone growth. It is possible that always in the beginning of acromegaly there is a hypersecretion of the thyroid. If this occurs late in life the enlargement seems to be of the ends of the bones and the extremities, although a few of the long bones grow. Certain it is that in acromegaly there is positive formation of new bone as well as an increase of the size of old bone, and this is normal hypertrophy. When this pituitary secretion becomes disturbed we have in these acromegalic cases almost continuous headache, sometimes excruciating in character. I have in several cases found these headaches were made better by feeding pituitary.

A corollary of this increased bone growth might be drawn, viz., to feed young dwarfs pituitary substance.

The glands of the body seem to be more or less interchangeable in their functions, if one is unable to do its work, another seems to take up extra work. This is true of the thyroid gland in acromegaly, and some of the early symptoms of this disease are due to too much action of the thyroid. Later in the disease the thyroid secretion is diminished, and I believe in every authentic complete autopsy on cases of acromegaly the thyroid has always been found atrophied, at least as to its parenchymatous portion, and a large number of the typical signs of acromegaly are due to this pseudomyxedema. Pituitary substance slightly stimulates the heart and contracts the blood vessels, but is greatly inferior to suprarenal in this respect.

The thymus gland atrophies in childhood and disappears after puberty, and hence probably performs some important function in the development and growth of the young child. If it performs any other function, some other gland or glands evidently assume such work after the age of puberty.

The thymus gland contains the largest amount

of nuclein and hence of phosphorus of any gland of the body, and will serve the purpose of any nuclein treatment. An extract of this gland is probably a constructor, and hence reconstructive, and can, as far as I am aware, never cause debility and does nothing but good. Inductively it would seem that this gland, which is so active during the period of greatest bone growth of the body, must have something to do with the formation of bone salts. As these earthy salts are all necessary to permanently encapsulate or to heal tuberculous lung lesions, I thought that theoretically thymus should be of value and have found practically that in tuberculous cases it was an aid to whatever hygienic or medicinal treatment was instituted. In other words, these patients very generally gain under thymus.

Many cases of exophthalmic goiter improve under the use of this glandular substance, but I have never found any treatment that would positively stop hypersecreting glands except morphine or codeine.

The thymus gland has been found absent in hemophilia, and it is interesting to note that thymus extract has shown some coagulant action on blood. Hence in hemophilia thymus gland should be tried.

This gland would seem theoretically of value in rickets. Objective cases of rickets in this age of good feeding are now so infrequent that in my non-surgical practice I have had no opportunity to give this treatment a proper test.

In the scurvy of children undoubtedly the blood is not getting what it needs, and perhaps it is the thymus gland that cannot get the salts that it requires, and this is the cause of the bleeding and other symptoms of that condition.

We are so much at sea in regard to the physiology of the internal secretions of the pancreas, spleen, testicles, ovaries, mammary glands and parotid, that we can draw no safe therapeutic indications for their use. Whatever is done in a therapeutic way with these extracts is purely empirical and mostly, as yet, experimental. Of course any gland like the testicles that contains nuclein, and hence phosphorus, will give tonic phosphorus to the system.

Turning now for a few minutes to the blood, and it would seem that chlorosis is due to bad chemistry somewhere, probably in the gastrointestinal canal, but perhaps some gland is not doing its work. At any rate it is often the fact that though these cases will all get well on either organic or inorganic iron, often best the latter, some of them will get well on some saline.

I have lately been much interested in the study of a case of lymphatic leucemia and believe that some interesting physiological facts have been demonstrated. This case is a man sixty-four years of age, who has all of the glands of his body enlarged, internal and external, as far as I can delineate, as well as a large liver and a fairly large spleen. We have had the patient under careful observation for a year and a half, and find

that his white corpuscles remain anywhere from 170,000 to as high as 380,000 per cubic millimeter. Over 98 per cent. of these white cells are lymphocytes, only a little over one per cent. being polymorphonuclear leucocytes, while normally about 75 per cent. of whites should be the polymorphous variety. In the laboratory we settled a mooted point, viz., that these white cells did not break down. If they did, we should have a greatly increased uric acid and phosphorus output. This man's uric acid and phosphorus output were perfectly normal on repeated and continued examinations, i.e., normal for a man with 8,000 white cells. The only treatment that markedly increased this uric acid output was an alkali, viz., bicarbonate of soda. Nucleic acid also somewhat increased it. If uric acid is mainly due to nuclear breakdown, this is pretty positive proof that these white cells do not rapidly disintegrate. On the other hand, while this bicarbonate of soda was being fed for one week his white blood count went from 203,900 to 380,000, while at the same time he lost red blood corpuscles.

Another interesting point was that any treatment that greatly reduced the size of his glands always made his white blood count greater and his red blood count less. This was true of the bicarbonate of soda, and very true of arsenic. Hence arsenic was in his case, at least, vicious treatment, although the glands grew smaller under it.

Nucleic acid was fed him on the theory that as it always causes leucocytosis, i.e., an increased number of the polymorphonuclear cells, if the lymphocytes were the origin of these cells, we ought to cause a great number of them to be formed. Nucleic acid did not cause any increased number of polymorphonuclear cells. If fed in large amount it did cause a diminished white blood count, but also diminished the red blood count.

One pernicious malarial chill reduced his white blood count from 238,000 to 68,000. The next day they went up to 170,000, and on the next chill, which we were unable to stop with enormous doses of quinine, the whites came down to 120,000. From that time on, the chills being stopped, the whites went up to their usual number.

His red blood count ranging between 3,000,000 and 4,000,000 always improved under Armour's red bone marrow and as regularly diminished under any other treatment.

Since the first of last July this man's blood has been counted every week. He has been having red bone marrow almost continually during this period, and his red blood count has averaged about 4,000,000. On October 12 he had been without this bone marrow for five days and his red blood count became 2,510,000, while a week before it was 4,200,000, a loss of 1,600,000 red blood corpuscles in five days without bone marrow. In six days more on bone marrow he had regained 600,000 of these corpuscles.

In this case, then, there is undoubtedly disease of the red bone marrow, also it is pretty good physiological proof that the red bone marrow produces red blood corpuscles, and also good proof that the feeding of red bone marrow supplies that deficiency.

Physiologists are about equally divided as to whether the lymphocytes are the origin of the polymorphonuclear leucocytes, or whether the polymorphonuclear leucocytes grow from the bone marrow. This case, having practically no corpuscles of this variety and his red bone marrow showing such evidence of disease, it would seem pretty good physiological proof that these polymorphonuclear leucocytes are formed in the red bone marrow.

I fear you will consider that this rambling talk has had no definite object, but when discussing the organic secretions, one is so flooded with possibilities and probabilities that it may not be amiss to exchange thoughts on the subject.

#### THE SIGNIFICANCE OF OXALURIA.\*

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OXALIC ACID may be regarded as a normal constituent of the urine. It is, however, present in very small amount, the quantity usually not exceeding 0.02 gram. in 24 hours. This acid exists in the urine in combination with calcium—calcium oxalate—which, under ordinary circumstances, is held in solution by another normal urinary constituent, *i.e.*, monosodic acid phosphate. Whenever the production of calcium oxalate is excessive the monosodic acid phosphate becomes insufficient to hold the oxalate in solution, the crystals separate and are found in the urinary sediment.

The term oxaluria is used to signify the presence of crystals of calcium oxalate in the urine. As the term is commonly applied, it may mean that the crystals are present temporarily or that their presence is persistent. Properly speaking, the term should be employed only to those cases in which the crystals are present for a considerable period, for, as we shall see later, oxalate crystals may suddenly appear and as quickly disappear from the urine of any healthy individual who is living on the average mixed diet. The number of crystals found in the sediment may be large or small depending upon circumstances. It should, however, be borne in mind that a few large primary crystals may be of far greater importance than a large number of the small secondary forms. The continued presence of the crystals always shows an overproduction of calcium oxalate which in turn usually indicates some pathological condition that is acting as a cause.

*Causes of Oxaluria.*—One important cause of an oxaluria is excessive fermentation in the gastro-intestinal tract. Dr. Helen Baldwin\* produced experimentally in dogs a pronounced oxaluria by feeding the animals on meat and large quantities of cane sugar or glucose. These substances were given until a marked degree of gastric and intestinal fermentation was produced; indeed, in some instances a distinct gastritis was induced. We know that meat contains only an infinitesimal amount of oxalic acid and that cane sugar and glucose contain none, therefore the oxaluria that was produced by the ingestion of these articles of food must have been brought about by other conditions. Dr. Baldwin noticed that the crystals of calcium oxalate were most abundant in the urine when there were distinct indications of an acute or subacute gastritis.

These experiments have proved highly instructive and important. Up to the time that Dr. Baldwin published the results of her research we were without a satisfactory explanation of the cause of oxaluria in many cases and the treatment of such cases was consequently attended with unsatisfactory results. Although Dr. Baldwin has clearly demonstrated that a marked oxaluria may result from the excessive fermentation produced by the ingestion of meat and large amounts of carbohydrates, we have yet to learn whether or not the proteid element is essential for the production of gastro-intestinal fermentation, and if so to what degree; also whether these fermentative changes and the consequent oxaluria can be brought about by the ingestion of carbohydrates alone. We still have no knowledge of the fungus or organism, if there be one, that appears to cause the undue formation of oxalic acid during fermentation. There is practically no doubt that a permanent diminution or an absence of hydrochloric acid in the contents of the stomach favors and is perhaps necessary for the development of this fermentative oxaluria.

There is still another cause of oxaluria which must be constantly borne in mind, *i.e.*, articles of food containing oxalic acid. Some of these substances are sorrel, rhubarb, tomatoes, asparagus, spinach, onions, cabbage, and some of the varieties of grapes and apples. Baroux† claims that when fresh fruits containing citric acid are taken with some of the above mentioned vegetables, oxalic acid is set free. He has reported nine cases, in one of whom, a young man, pain and an acute gastro-enteritis followed a meal which consisted partly of spinach and cherries. In two children the same symptoms resulted from the ingestion of spinach and oranges. We find no accurate record of the urinary findings in his cases. While the claim of Dr. Baroux concerning the chemical processes taking place in the stomach under such circumstances is largely conjecture, we know that oxalic acid is in many

\* Paper read before the New York State Medical Association, New York County, January 19, 1903.

\* "An Experimental Study of Oxaluria with special reference to its Fermentative Origin."—The Journal of Experimental Medicine, October, 1900.

† Journal des Sciences de Lille.

instances set free, but how and in what manner, we have yet to learn.

Rhubarb and asparagus probably constitute the chief causes of oxaluria from the food. Since oxalic acid is the principal acid of rhubarb we can readily appreciate the amount of harm that may result from the custom of taking stewed rhubarb and rhubarb pie. Sorrel is fortunately little used, while the tomato, the apple, the grape and the onion contain only minute amounts of the acid. If food rich in oxalic acid is taken only rarely and in small amounts, the resulting temporary oxaluria will probably very quickly disappear and be productive of little or no harm. But the dietetic element is no less important, especially in those individuals who are already afflicted with an overproduction of oxalic acid.

It is highly probable that many of the instances of oxalates in the urine are due both to the oxalic acid preformed in the food and to their formation by intestinal putrefaction or fermentation. If, after removing all oxalic acid containing substances from the food, the oxaluria persists, we can be fairly certain that the cause lies in the digestive tract.

*Indoxylpotassium Sulphate and Oxaluria.*—Indoxyl, also sometimes called "Indican," is a normal urinary constituent, and exists in the urine as an ethereal or conjugate sulphate—indoxylpotassium sulphate. It appears to be formed by the oxidation and absorption of indol which in turn is a normal constituent of the intestine and a product of the natural (or normal) intestinal putrefaction. If this putrefaction or fermentation is abnormally great, the indol is produced in unusually large quantity and the output of the indoxyl sulphate is correspondingly large. The tests for indoxyl in the urine are, therefore, an index of the amount of fermentation taking place in the intestine. An important fact is that a well-marked oxaluria is almost always accompanied by an increased amount of indoxyl, showing that there is a more or less intimate relation between them and that they probably have a common cause.

*Character of the Crystals of Calcium Oxalate.*—Calcium oxalate crystallizes from the urine in two typical forms—the octahedral and the dumb-bell crystals. There are, however, various modifications of these two forms, according to the positions of the crystals. You are all perfectly familiar with the octahedral or so-called "envelope" crystal, which is made up of two four-sided pyramids placed base to base, and when viewed from the side their characteristic appearance is that of a square crossed obliquely by two bright lines presenting the resemblance to a sealed square envelope. Frequently these octahedra coalesce in such a way as to have the appearance of an open umbrella, constituting the so-called "umbrella" crystal. Sometimes each half of the octahedron is connected by a short quadrilateral prism and such have been termed "prismatic" crystals of calcium oxalate.

The dumb-bell and oval crystals are more rarely found in the urinary sediment than the octahedral forms. The dumb-bell crystals are always associated with the oval or circular forms which have bright centers showing their biconcavity. Frequently two dumb-bells are found crossed at their centers forming a double dumb-bell crystal.

Since calcium oxalate crystals may be found in either an acid or an alkaline urine, the colorless dumb-bell crystals should in all instances be distinguished from the yellowish-red or brown dumb-bells of uric acid and of acid ammonium urate, and the octahedral forms should not be mistaken for the ammoniomagnesium or triple phosphate crystals found in the sediment of an alkaline urine. These various forms of crystals are usually readily distinguished by their microscopic appearance and the accompanying elements, or by chemical tests.

*Primary and Secondary Crystals.*—From a clinical point of view it is important that a distinction be made between those crystals that are likely to produce mechanical disturbances in the urinary tract and those that are harmless. Two classes of crystals are, therefore, generally capable of recognition, i.e., the primary and the secondary. Primary crystals are those that have separated from the urine inside the body; they usually consist of the large octahedral and most of the oval and dumb-bell forms. Secondary crystals are those that have separated after the urine has left the body; they are usually the very small octahedral forms and perhaps a few of the very small oval, circular and dumb-bell crystals. These secondary crystals are most commonly found in a urine that has been allowed to stand for some time. They generally separate from a urine that is highly charged with calcium oxalate.

*Mechanical Action of the Crystals.*—The primary crystals of calcium oxalate often produce a more or less marked irritation of the urinary tract, especially if they separate from the urine in the kidney itself or in the renal pelvis; the mechanical action is usually much less severe if the crystals separate in the bladder. Blood globules are the chief accompaniment of the oxalate crystals in the sediment, and there may even be abundant hemorrhage. If the kidney is the seat of an acute irritation, renal casts with adherent blood globules, and sometimes with calcium oxalate crystals imbedded will be found; if the renal pelvis is involved, the small caudate cells which are more or less characteristic of the superficial layer of the pelvis of the kidney will be found accompanying the blood and the crystals; and if the bladder is the seat of the mechanical disturbance, the large squamous cells and the round dense cells from the neck of the bladder will usually serve to locate the source of the blood. Such severe mechanical irritation is usually accompanied by pain, often frequent and painful micturition and by a more or less concentrated urine. If the separation of these primary crystals continues for some time, the ten-

dency to a calculus formation in the pelvis of the kidney or the bladder is, of course, very great and especially in those cases in which there is or has been considerable hemorrhage.

*Oxaluria and Diabetes Mellitus.*—There appears to be a rather close relation between diabetes mellitus and an oxaluria. This is usually seen in two classes of cases: (1) those in which the diabetic patient is allowed to take such articles of food as he likes, and who, on account of his craving for sugars and starches, subsists largely on carbohydrates; and (2) those in which the diet is restricted almost entirely to a meat diet. It seems to the writer that the explanation of the oxaluria in such cases is probably the gastrointestinal fermentation which results from either the excessive carbohydrate diet or the abundant ingestion of meat—a nitrogenous diet.

Not infrequently a marked oxaluria is an accompaniment of nervous disorders, especially those attended with mental depression, a subacute or chronic prostatitis, and diseases of the heart and lungs. I am unable to give you any plausible explanation of what appears to be an excessive formation of oxalic acid in these cases. In some instances both the food and the intestinal digestion may be at fault, but there often appear to be other unknown causal factors. It has been claimed by some that under pathological conditions oxalic acid circulates as such in the blood, and on account of its poisonous action, causes a certain train of symptoms of which nervous phenomena are especially prominent. This theory appears, however, to be untenable. We have no satisfactory proof that oxalic acid ever circulates as such in the blood, or that the nervous symptoms are the result of the direct or indirect action of the acid or of calcium oxalate. In diseases of the heart and lungs the accompanying oxaluria has been ascribed to deficient oxidation. This theory is based on the belief that oxalic acid may exist in the body as an intermediate product between uric acid and urea, and that it is formed as the result of incomplete oxidation. This explanation may be, to some extent true, but further investigation is necessary to prove that an oxaluria actually has such a cause.

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#### THE PROGNOSTIC VALUE OF THE DIAZO-REACTION IN PULMONARY TUBERCULOSIS.

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TO ST. LUKE'S HOSPITAL.

In one of his early papers on the diazo-reaction, published in 1883, Ehrlich speaks of the prognostic value of the reaction both in typhoid and in phthisis. He considered that a marked reaction in either disease was an indication of a severe infection and that in pulmonary tuberculosis especially, a continuous and strong reaction was a sign of very grave prognostic import. A num-

ber of theses and papers by other observers were published about this time, showing that in a large proportion of cases the reaction became more strongly marked as the disease advanced and frequently afforded useful prognostic data; but that there were fatal cases which did not show the diazo-reaction before death and that there were mild cases in which, though a strong reaction was present at some time during the course of the disease, yet the patient progressively improved.

Since 1884 but little has been published on this subject; but with the present revival of chemical and microscopical diagnosis in internal medicine, the diazo-reaction has again come into prominence especially through the writings of Michaelis, Schraeder and Nægelsbach, Becker, Clemens, and others. The more recent writers, on the whole, agree with the original views published by Ehrlich, but some have been unable to confirm his results. The subject is one of such general interest that it seemed proper to pursue it further and especially on a large series of cases under similar conditions. This opportunity occurred in the wards of St. Luke's Hospital, where a large number of cases of progressive phthisis were under observation. A considerable number of these cases came to autopsy and the anatomical findings were of value in controlling the results of the physical examinations. Owing to the unfavorable conditions under which tuberculous cases are placed when treated in hospitals within city limits, it is the rule at St. Luke's to retain in the hospital for any length of time only such patients as seem beyond the hope of cure by climatic treatment, and to urge all others for whom there is a reasonable hope of recovery to leave the wards and to attempt to find either homes in the country or care in one of the sanatoria for tuberculosis. In this way the cases are immediately divided into two sharply distinguished groups. In the first are all early, non-progressive cases, which as a rule leave the hospital in a few weeks, often sooner. In the other group are those cases in which an active and progressive process is under way. Many of these cases die in the first few months of hospital treatment; others live for a year or more; but very few leave with any improvement in the pulmonary condition. Opportunity is thus offered to study a series of severe cases of tuberculosis and to observe the variations in the urinary reactions.

The total number of cases examined was 363. In all those patients who remained in the hospital for more than a few days the diagnosis was verified by the finding of tubercle bacilli in the sputum. Only in a very few, exceptionally mild cases, were the bacilli not found during the short stay of these patients in the wards. Of these 363 cases, 117 died. The results of the examination of the urine of the fatal cases showed that in 81 cases, or 69 per cent. of those who died, the diazo-reaction had been continuously positive before death. In 22 cases, or 18 per cent., there had been a positive reaction during a large portion of the time during which the patient had been

treated, but this disappeared shortly before death. In other words, about 90 per cent. of the fatal cases show a positive reaction during the last few months of life. Of the 14 remaining cases which at no time showed a reaction, ten had the symptoms of a chronic diffuse nephritis; and two of the cases undoubtedly died from the kidney lesion. The kidney lesion seems to interfere with the excretion of the substance producing the diazo-reaction, a point to which Clemens has called attention. Two other cases not giving a reaction died of hemorrhage from the rupture of a large vessel in the lung, though the tuberculous process was not active at the time.

The cases which were discharged numbered 246. A certain number of them left the hospital for reasons of discipline or because they did not like the treatment which they received. These numbered 22. Twelve were severe cases and had a continuous positive reaction. Three were positive at some time; seven were negative. Of the remaining 224 cases which left the hospital in good condition, 16 were observed for so short a time that their results should not be included here; some of these cases gave faint positives or a positive on the day after admission and a negative a few days later. Of the 208 cases left after subtracting the above; that is, cases which could be fairly considered as mild non-progressive forms; 188, or 90 per cent. of those examined for over four weeks showed no reaction. The 20 other cases gave alternating reactions; that is, positive one week or month, and negative the next; so that no conclusion could be drawn from their examinations. If we take, then, the cases which may be considered as unfit for hospital treatment and capable of cure, we find that some 10 per cent. give occasional diazo-reactions, so that it does not seem possible in this country to apply the rule which is suggested for the German sanatoria by Michaelis and Clemens, to exclude all cases with a positive diazo as unfit for climatic treatment, especially as a good many persons with a very slight lesion give a diazo-reaction on admission, and then, as they improve under the altered hygiene, the good food, and the rest in bed which they obtain in a hospital, never give a reaction during the further period of examination.

If we collect all the cases which were admitted to the hospital and examine them to see how many gave a positive reaction at some time during their residence, we find the number to be 154, or 42 per cent. of the whole. The number would be considerably reduced if we were to exclude those cases which gave a single positive reaction on admission and then a continuous negative. If now we compute the number of fatal cases in the 154 which gave a single positive reaction the number will be found to be 103; that is, 66 per cent. of those who apply for hospital treatment and are found to give a positive reaction will die, and the largest number within six months.

These results correspond very well with those reported by others. For example, Clemens found

that 87 per cent. of the fatal cases show a positive reaction. Rutim yer found that 85 per cent. of the fatal cases in his series gave a positive reaction; while Michaelis noted that 72 per cent. of the cases giving a positive reaction die within six months.

Of the exact chemical nature of the substance or substances which cause the diazo-reaction, we are as much in the dark as when Ehrlich first published the method nearly twenty years ago.

We know only that it is produced by the actions of bacterial toxins and during the course of abdominal metabolism such as goes on in a patient suffering from a gastric carcinoma or from a chronic heart lesion. It may be produced in animals by the injection of the toxins of the tubercle bacilli as they exist in Koch's tuberculin T. R. It is easily destroyed by the alkaline fermentation of the urine and disappears from that fluid on long standing or on prolonged boiling, which will distinguish it from the drug reactions especially from that produced by naphthalin or  $\beta$ -naphthol. In general the drug reactions can be recognized by any one familiar with the color of the diazo-reaction, so that there is but little danger of confusion. The foam is never salmon pink, but yellowish or purple. The reaction is not dependent upon temperature, for some of the cases in my series showed a constant and strong positive with a normal or subnormal temperature.

The appearance of the diazo-reaction in the urine is not a constant phenomenon. In looking over a series of tests carried out for a long period of weeks or months, it will be noticed that the reaction may be continuous and strong for a month or so and then suddenly disappear for a week or so only to reappear later on in its original intensity. During this time the condition of the patient may grow progressively worse so that it would be expected that the reaction would remain quite constant. The conditions underlying this variation are not completely understood. It was noticed by my assistant, Dr. N. E. Ditman, that the reaction seemed to vary somewhat with the atmospheric conditions; that is, on excessively hot, damp days the reaction in a group of patients was usually more intense than on cool, dry days. This variation is no doubt due to the fact that the condition of the patient was influenced unfavorably by the excessive heat. Perhaps also the question of food and the body metabolism may be concerned. The variation, however, was never very great and any case showing a strong positive reaction, or a negative, continued to give a positive or a negative, the action of the temperature not being sufficient to completely suppress the reaction or to bring it on. An important factor in suppressing the reaction in the urine is due to drugs. As Burghart has shown, some of the tannic compounds, such as tannalbin, tannigen, or even a decoction of uva ursi which contains tannin, are capable of causing a disappearance of the reaction from the urine. Creosote and creosotal also cause a great diminution in the intensity of the reaction or may even sup-

press it. Clemens has also shown that the presence of bile, urobilin, or hydrochinon in the urine, may interfere with the reaction. In such cases he recommends the removal of the pigment by the addition of a few drops of lead acetate solution or a little animal charcoal and then filtering. It is often possible to obtain a reaction by shaking out the acidified urine with ether or amyl alcohol, neither of which extracts the diazo-substance. The intense yellow reaction which we often meet with in the urine of phthisical patients has been shown by Burghart to be due to phenol which is often present in excess in the urine of the severe cases and as a rule completely obscures the reaction. The excess of phenol in such urines can be easily demonstrated by adding to a test tube of the urine some strong nitric acid and boiling. After the mixture has cooled some bromine water is added and if a marked turbidity of the urine is produced an excess of phenol compounds may be assumed. This excessive production and excretion of phenol compounds is often observed in severe cases of phthisis and often accounts for the frequent absence of the reaction at that time. Cases, however, of excessive phenol excretion have been observed in which the diazo-reaction could still be easily obtained so that other causes must play some part. One possibility is that the excretion of the diazo substance in the urine takes place irregularly as has been noted in the normal excretion curve of other substances, notably urea. As is well known the urea of the body is not excreted constantly, but there may be a slight retention for a day or so and then the surplus will suddenly be got rid of through the kidneys. This may also be true of the diazo substances. As an evidence of this we may note that in the fourteen cases of phthisis which died without a positive reaction having been present, ten had an active chronic nephritis with casts and albumin. The urinary excretion in nephritics is known to be exceedingly irregular and retention of metabolic products is often seen extending over considerable periods of time and it is not improbable that the diazo bodies are subject to the same conditions.

The reagents used were those recommended by Ehrlich in the *Charité-Annalen* in 1886. Two solutions were employed which were mixed at the time of using:

I Sulfanilic Acid .....	I
Strong Hydrochloric Acid.....	50
Aq. ad.....	1000
II Sodium Nitrite .....	.5
Aq. ....	100

Two c.c. of II are added to one hundred c.c. of I. The mixture will keep in good condition for about two days in a cool place. Equal parts of urine and the reagent are mixed in a test tube, and one-seventh or one-eighth part of ammonium hydrate is added. The salmon pink color of the foam obtained after shaking is the essential point in a positive reaction.

If we sum up in concise form the results of this study they will be as follows:

I. If the urine of a case of pulmonary tuberculosis shows no diazo-reaction and a kidney lesion can be excluded the prognosis is favorable. Only ten per cent. of the moderately severe cases here recorded gave a reaction and in a number of these the reaction disappeared on treatment. Early cases not ill enough to apply for hospital treatment do not give the diazo-reaction.

II. If the urine of a case of pulmonary tuberculosis shows an occasional diazo-reaction the prognosis is not necessarily grave as only some 66 per cent. of the patients showing an occasional positive reaction die.

III. If the urine of a case of pulmonary tuberculosis shows a continuous strong diazo-reaction the prognosis is very grave since a large proportion of such cases die within six months.

IV. The presence of a diazo-reaction on the first examination of a patient should not debar the case from a thorough trial of climatic treatment in a proper sanatorium.

I wish to express my obligation to Dr. Norman E. Ditman, late pathological interne at St. Luke's Hospital, for his valuable assistance in carrying out the reactions and in the preparation of this paper; also to Dr. J. D. Condit and Dr. F. G. Hodgson, who carried out a portion of the tests during their service as pathological internes at St. Luke's Hospital.

#### BIBLIOGRAPHY.

1. Asada—Inaug. Diss., Erlangen, 1901.
2. Beck—Prognostic Bedeutung d. Diazo bei Phthisikern, *Charité Annalen*. Bd. 19, 1884.
3. Becker—Münch. med. Woch., 1900.
4. Burghart—Berl. klin. Woch., 1899; Berl. klin. Woch., 1901, p. 276; Deut. med. Woch., Vereins-Beilage, 1901, p. 195.
5. Clemens—Deut. Arch. f. klin. Med., 1899, p. 74.
6. Dames—Nederl. Tijdschrift voor Geneeskunde, 1900, p. 1185; Abst. in Cent. f. innere. Med., 1901, p. 181.
7. Ehrlich—Zeit. f. klin. Med., 1882, p. 285; *Charité Annalen*, 1883.
8. König—Klin. therap. Woch., 1900.
9. Krokiewicz—Wiener klin. Woch., 1898, p. 703.
10. Michaelis—Berl. klin. Woch., 1900.
11. Rutimeyer—Corresp. f. Schweitzer, Aerzte, 1890.
12. Schraeder and Naegelsbach—Münch. med. Woch., 1899, p. 1339.

#### HYPERACIDITY OF THE URINE.

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THE recognition of symptoms of disturbance of the genito-urinary tract arising from the acid character of the urine is found in medical books of 20 to 30 years ago<sup>1</sup>; and recently Brown<sup>2</sup> has reported nine cases presenting symptoms of cystitis in which the symptoms could be directly referred to excessive acidity of the urine, this hyperacidity being regarded as probably of neuropathic origin, since all these cases "exhibited neurasthenical, neurotic or hysterical manifestations" and the bladder symptoms became much worse "under severe mental or nervous strain; and by the result of treatment."

In the writings of 20 years ago, e.g., Gross' *Surgery*, Vol. II, 1882, p. 704, the acid character

of the urine is given as one of the causes of incontinence in children, and to-day in some cases afflicted with enuresis, it will be found that excessively acid urine is being voided, the condition improving or disappearing entirely under treatment directed to correction of the hyperacidity.

Some books on nervous diseases describe a "lithemic neurasthenia"; a condition improved by treatment with acid or alkali, the alkali being more often beneficial, in addition to measures to improve the general condition. The acid or alkali was given empirically, no means being known for determining beforehand which would be the better.

Brown's cases correspond to the cases improved by taking alkalis. The determination of the excessive acidity of the freshly voided urine furnishes a reason for the administration of alkalis rather than acids in such cases.

Text-books<sup>3</sup> on genito-urinary diseases give "over-acid urine" as one of the causes of "nephralgia," a term applied loosely to a dull deep ache extending from the back or lumbar region downward and forward to the bladder and urethra, and the urine of such cases is described as follows: high specific gravity, deep color, the "alkaline tide" after meals usually absent, a heavy precipitation of amorphous urates after cooling and of uric acid a few hours after voiding, and more or less pus present in proportion to the amount of irritation and the duration of the complaint. The precipitation of urates and uric acid should have been considered of little significance, but the absence of the "alkaline tide" and the presence of pus cells, or rather polynuclear leucocytes in varying amount are suggestive of an over-acid urine.

*The Normal Acid Reaction of the Urine.*—Normally the urine shows a decrease in acidity or a faintly alkaline reaction to litmus a few hours (1 to 3), after eating, the decrease varying in inverse ratio to the amount of acid secreted in the gastric juice and with the nature of the food. Sahli<sup>4</sup> states that this relation to the gastric juice is such that with a pathological hyperacidity of the gastric juice the urine may show a deposit of or readiness to precipitate phosphates which is erroneously looked upon as a "phosphaturia" due to some anomaly of metabolism, while in fact this reduction in acidity and the deposit of phosphates is a basis with likelihood for the diagnosis of a gastric affection.

An excess of meat in the diet, in that it furnishes much proteid, and the increased destruction of body-proteid in fevers favor a marked acid reaction to the urine, but in the cases of hyperacidity with symptoms referred to, the diet is rarely found at fault and the patients are afebrile. It is probable that the over-acid reaction depends more often upon the relation of the primary and secondary phosphates in the urine than upon an excess of phosphoric acid derived from the food or from excessive destruction of body-proteid.

The urine does not contain free acid under any

conditions (Neubauer and Vogel, *Analyse des Harns*, 1898, p. 2).

The normal acid reaction is due to acid salts, principally if not entirely to the primary salt of phosphoric acid ( $MH_2PO_4$ ).

Hammarsten<sup>5</sup> states that from neutral substances (proteids, etc.) arise within the body acids such as sulphuric and phosphoric and organic acids as hippuric, uric, oxalic, and aromatic oxy-acids, from which it follows that the acid reaction cannot be dependent upon one acid alone, but the general opinion is that the acidity of the urine of man is due to the primary salt of phosphoric acid.

The degree of acidity does not, however, depend alone upon the amount of primary salt present, but also upon the relation between the primary and secondary salts ( $MH_2PO_4$  and  $M_2HPO_4$ ).

In normal urine the primary salt may vary from 34.9 per cent. to 74.2 per cent. of the total phosphates, and when 34.9 per cent. or under the reaction is amphoteric to litmus in all other cases acid.<sup>6</sup> Of the total phosphoric acid in 24 hours about 0.6 is in the form of the primary salt and 0.4 in the form of the secondary salt.<sup>7</sup> Amphoteric reaction to litmus is obtained when the solution contains 0.3 to 0.5 of the primary salt and 0.7 to 0.5 of the secondary salt.<sup>8</sup> The primary salt is acid and the secondary salt alkaline against litmus, and both may be present in solution in the proportions last mentioned without the one interfering with the reaction of the other to litmus, thus explaining the amphoteric reaction.

*Estimation of Acidity.*—The old idea, still prevalent, that excessive acidity is indicated by the precipitation of uric acid and oxalic acid is without good foundation. In certain febrile conditions and in concentrated normal urine, the urates and uric acid are often quickly precipitated causing at first a diffuse cloudiness and later, after standing a few hours, a sediment. The acidity of such a urine may or may not be increased; and, further, the precipitation of these substances does not necessarily mean an increase in the excretion of these substances, for their precipitation probably depends upon the relations between and interaction among the urates and phosphates, rather than upon the amount of uric acid present.<sup>9</sup>

Although many over-acid urines contain crystals of oxalate of lime this is no indication of degree of acidity nor is it an index of the amount of oxalic acid present, for such crystals "are found with every degree of acidity from highly acid to alkaline; with every degree of specific gravity and with every color" (Baldwin<sup>10</sup>).

The precise method for estimation of the acidity is that for the estimation of the primary salt of phosphoric acid (Hammarsten<sup>11</sup>). Of the simpler methods, the reaction to litmus paper gives no idea of the degree of acidity and in the titration of phosphates litmus gives no sharp color change.

Neumeister's<sup>12</sup> modification of Maly's method

is unreliable, according to Nægeli<sup>18</sup>. Blumenthal<sup>14</sup> recommends it. The best method to employ is that recommended by Nægeli<sup>18</sup>, similar to the method used to determine the total acidity of the gastric contents, using phenolphthalein as an indicator and titrating with a decinormal solution of sodium hydroxide ( $\frac{N}{10}$  NaOH).

This method gives roughly the excess of acid-equivalents over the base-equivalents, but is no index of the basic-capacity of the urine, for only as much alkali-equivalent is added as is already contained in the phosphates corresponding to the primary salt ( $MH_2PO_4$ ) which enters into the reaction.

Those acids which are excreted in the form of neutral salts (as NaCl) or in the form of salts reacting alkaline to phenolphthalein (as secondary phosphates,  $M_2HPO_4$ ) are not included in the acidity (Sahli<sup>16</sup>).

Haig<sup>17</sup> found the average acidity of the 24 hours' urine in health equivalent to 5.5 gm. of oxalic acid or 3.5 gm. of sodium hydroxide. Hammarsten<sup>18</sup> gives the acidity equivalents for 24 hours as 2 to 4 gm. of oxalic acid or 1.3 to 2.39 of hydrochloric acid. Haig's equivalent of 3.5 gm. of sodium hydroxide in terms of hydrochloric acid is 2.44 gm., so that both of Haig's equivalents are higher than those of Hammarsten.

Brown found that normal urine immediately after withdrawal from the bladder was neutralized by 2.5 c.c. of decinormal sodium hydroxide solution for 10 c.c. of urine, or 25 c.c. for 100 c.c.

Provided these patients were passing the average 1,500 c.c. of urine in 24 hours the equivalents in terms of oxalic acid and hydrochloric acid are considerably below Haig's, but within the lower limits of Hammarsten.

Among dispensary patients of various sorts with normal urines we have found the average degree of acidity to be 3.1 c.c. of decinormal sodium hydroxide solution in 10 c.c. of urine, equivalent to 2.4 gm. of sodium hydroxide in 24 hours, or a little over a fourth less than Haig's figure. In the normal urines of healthy persons the variation has been from 1.5 to 4.5 c.c. of decinormal hydroxide solution.

In estimating the hyperacidity, urine not over a few hours old should be used, if albumin is present it should be removed, and, if dark in color the same should be diluted to prevent interference with the sharpness of the change in color of the phenolphthalein. To 10 c.c. of urine add a few drops of an alcoholic solution of phenolphthalein (0.1 per cent. in 50 per cent. alcohol), and titrate with decinormal sodium hydroxide solution to a well-marked red color. The precise tint depends of course upon the tint for which the decinormal solution has been standardized. The period of the day in which the urine is taken matters but little, since a urine which is sufficiently acid to produce symptoms does not show the marked reduction in acidity or alkalinity seen in a normal urine after meals.

A hyperacid urine shows a marked acidity throughout the 24 hours. After standing a few

hours the normal decrease in acidity may interfere with the estimation in a urine slightly above normal, but an overacid urine which is the cause of symptoms will often give an acidity 3 to 5 times above normal 10 to 24 hours after voiding.

The so-called "acid fermentation" will not interfere with the estimation, for the urine probably never undergoes such a fermentation in that the change in color and the deposit of crystals of uric acid and oxalate of lime are unaccompanied by an increase in acidity, as noted by Roech<sup>19</sup> in 1874.

Roech stated that the acidity of the urine gradually decreased from the moment of voiding and that a deposit of urates and uric acid did not mean an increase in acidity but was due to concentration, in over 20 urines followed from day to day.

Urine which shows a faintly alkaline reaction to litmus will sometimes show a slight degree of acidity with phenolphthalein. Such a urine will usually be found to be amphoteric to litmus.

*Note.*—Solutions of ammonium carbonate (e.g., in the urine) react alkaline to litmus and produce no change (to a red color) with phenolphthalein, thus accounting for a urine alkaline to litmus and at the same time showing a certain degree of acidity when titrated with  $\frac{N}{10}$  NaOH solution with phenolphthalein as an indicator.

*Cases of Hyperacidity with Symptoms.*—Brown<sup>20</sup> designated the normal acidity 10 (= 2.5 c.c.  $\frac{N}{10}$  NaOH for 10 c.c. urine) for convenience, and his cases showed degrees of acidity varying from at least twice above normal, to nearly five times normal. A degree of acidity equivalent to 4 c.c. is often found without symptoms, but as in Brown's cases urine above 5 or 6 c.c. often produces symptoms in the genito-urinary tract, such as burning on micturition, frequent micturition, enuresis, and symptoms of cystitis in neurotic individuals particularly.

Among 100 cases, 40 presenting symptoms of disturbance of micturition in the course of some affection were tested in regard to acidity of the urine and 30 of this number were normal. These 30 cases included acute articular rheumatism 2, acute muscular rheumatism 1, chronic interstitial nephritis 18, chronic cystitis and urethritis 2, alcoholic hepatic cirrhosis 1, carcinoma of rectum with marked secondary anemia 1, median palsy 1, hemiplegia 3, and facial neuralgia 1.

Ten cases including acute articular rheumatism 3, chronic interstitial nephritis 6, and chronic valvular cardiac disease 1, gave an acidity varying from 6 to 14 c.c., and the disturbance of micturition was no greater than in the 30 negative cases.

In 19 cases of urethral and cystic disturbances with symptoms suggesting inflammation of these parts no other causes than a neurotic individual and an increased degree of urinary acidity (from 5 c.c. to 15 c.c. of decinormal alkali solution) were found to account for these symptoms, which disappeared under attention to the general condition and the taking of alkalis (sodium bicar-

bonate or potassium citrate) without local treatment.

Three of these cases had apparently recovered from recent attacks of urethritis.

As stated by older writers, hyperacidity of the urine is found to be the cause of some cases of enuresis and the condition is improved or cured by the administration of alkalies or of strychnine. In 10 of these cases the degree of acidity varied from 5 c.c. to 11 c.c. of decinormal alkali solution and in 10 similar cases the acidity of the urine was normal.

The simple treatment with alkalies causing disappearance of the symptoms in these over-acid cases upholds the view that hyperacidity alone is at times the cause of the condition, but the cause of the hyperacidity is not so readily determined, in that the dietary in these cases seems to have been normal, the average amount of exercise taken, and the general health excellent. No inquiries were made in regard to the use of "preserved foods" which might contain boric or benzoic acids or borax.

From the experiments of Tunncliffe and Rosenheim<sup>21</sup> we learn that the taking of boric acid does not increase the acidity of the urine, though we find statements to the contrary, while borax may increase it but slightly.

The third set of cases includes 21 diagnosed as neurasthenia after thorough clinical and laboratory examinations, these patients referring to some disturbance of micturition, among the numerous complaints in regard to disturbances in various parts of the body.

The only abnormal change in the urines of 14 of these cases was an increase in acidity, from 5.5 c.c. to 12 c.c. of decinormal alkali solution, corrected by a more persistent giving of alkalies than required by the cases of enuresis and of genito-urinary disturbance without the marked stigmata of neurasthenia.

The seven remaining cases showed normal degrees of acidity, suggesting that hyperacidity in such cases may be of neuropathic origin, as suggested by Brown, thus accounting in part for the necessity of persistent administration of alkalies in addition to treatment of the general condition.

Some of the urines from the above cases quickly deposited urates, uric acid and oxalate of lime, these deposits being in no way related to the degree of acidity. Of the 47 negative cases with an acidity below 5 c.c. of decinormal alkali solution 11 (23.4 per cent.) with an acidity from 1 c.c. to 4.5 c.c. deposited urates, uric acid, or oxalate of lime soon after voiding. Of the 53 positive cases with degrees of acidity from 5 c.c. to 15 c.c. of decinormal alkali solution 15 (28.3 per cent.) deposited urates, uric acid, or oxalate of lime, and 38 cases, one with an acidity as high as 15 c.c., showed no deposit after standing twenty-four hours.

In three urines (acidity 8 c.c.) the primary ( $MH_2PO_4$ ) and secondary ( $M_2HPO_4$ ) phosphates were respectively 0.7 and 0.3 of the total,

while the total phosphates were low, 1.5 gm. to 181 gm. in 24 hours.

The number of cases referred to is insufficient to give a definite idea of the frequency of occurrence of such cases, but some of them serve to add to the value of Brown's reported nine cases, and to suggest a simple and reasonable method of treatment for some cases of frequent micturition and nocturnal incontinence.

#### BIBLIOGRAPHY.

1. Hoffman and Ultzmann—Untersuchung des Harnes, 1878, p. 26.
2. Brown—Johns Hopkins Hospital Reports. Vol. X, 1901, pp. 38, 39.
3. Keyes—Genito-urinary Diseases, 1888, p. 322.
4. Sahli—Untersuchungsmethoden, 1902, p. 471.
5. Hammarsten—Physiologische Chemie, 1899, p. 417.
6. Neubauer u. Vogel—Analyse des Harnes, 1898, p. 23.
7. Neubauer u. Vogel—Analyse des Harnes, 1898, p. 23.
8. Neubauer u. Vogel—Analyse des Harnes, 1898, p. 29.
9. Neubauer u. Vogel—Analyse des Harnes, 1898, pp. 623-624.
10. Baldwin—Journal Experimental Medicine, Vol. V, No. 1, p. 33.
11. Hammarsten—Physiologischen Chemie, 1899, pp. 418-420.
12. Neumeister—Lehrbuch der physiologischen Chemie, 1895, II, pp. 225-226.
13. Sahli—Untersuchungsmethoden, 1902, p. 550.
14. Blumenthal—Pathologie des Harnes, 1903, p. 6.
15. Sahli—Untersuchungsmethoden, 1902, p. 547.
16. Sahli—Untersuchungsmethoden, 1902, pp. 548-549.
17. Sahli—Untersuchungsmethoden, 1902, p. 550.
18. Hammarsten—Physiologische Chemie, 1899, p. 419.
19. Reoch—Lancet, 1874, vol. II, p. 549.
20. Brown—Loc. cit.
21. Tunncliffe and Rosenheim—Journal of Hygiene, Vol. I, No. 1, p. 168.

#### THE PROGNOSTIC SIGNIFICANCE OF ALBUMIN IN THE URINE.

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IS IT possible to make a differential prognosis when albumin is found in persons apparently healthy?

Injudicious living is the cause of most of the bodily ills from which we suffer, and is also that which induces unduly early degeneration in the majority of cases met with by medical men. Injudicious living I mean to be taken in the broadest sense. It includes the excessive wear and tear of an active business life, the nervous strain and worry necessary in the mad rush to become rich; the incessant drain upon one's vitality by the daily excesses in eating, the abuse of alcohol and tobacco, and the excesses common to those who have never learned the art of self-control. In such cases, sooner or later, largely dependent upon the inborn vitality of the individual, occur changes in the minute tissues of the bodily organs. The organ which ordinarily gives the first hint of this commencing degeneration is the kidney. It would be a waste of time to describe either its minute anatomy or functions. We all know it is the most important excretory organ, and that perfect peace reigns when its functions are normal. One of the first symptoms the kidney gives that something has gone wrong in the complex mechanism and functions of the body is the passing of albumin with the urine, more or less abundantly. In my judgment no healthy individual has this substance in the urine,

and its presence is a sure indication that something is out of gear somewhere in the functions of the body. On finding this albumin must we infer that the individual is doomed to an unduly early death or that he necessarily has an organic disease? By no manner of means, as the kidney is so sensitive to temporary disorders, so sure to carry off every abnormal product found in the blood, that it often suffers from temporary disability, quickly rallying when the offending substance has been eliminated. Again, when sudden excessive heat or cold prevails, and the nerve centers are temporarily depressed, the kidney feels the lack of its proper nerve supply, allows albumin to pass through, coming back to its normal function without permanent damage as soon as the excessive temperature ceases. It is not necessary to consider the many causes of albuminuria, known and suspected, because their name is legion, and you know well enough that most causes are temporary in character, doing no apparent injury unless the cause is continued long enough or is frequent enough to start tissue changes in the structure of the kidney and producing in time a fatal termination.

With this introduction this paper has been written from the point of view of a life insurance examiner, to see if any information can be given by which one can judge in any given case whether the albuminuria is due to temporary conditions or is the beginning of a degeneration of the kidney tissues, necessarily fatal. In other words, is it possible to differentiate in regard to prognosis in apparently healthy persons between temporary albuminuria and that which means such tissue changes as must necessarily seriously interfere with the expected longevity of the individual? Please remember that an applicant for life insurance is not knocking at our door for treatment. He presents himself as a presumably healthy person. He is surprised, annoyed, often angered, sometimes frightened, when informed that anything is wrong. The medical man is abused, called a crank, narrow-minded and a fool, with strong adjectives prefixed to the fool. If a rejected man happens to live ten years the case is quoted, brought up as illustrating the absurd rulings of the doctor, the accuser forgetting the many apparently similar cases which have proved fatal in the meantime. Our learned Professor Osler wrote a very interesting article in 1901, showing how some men having been rejected by prominent life insurance companies were still living and in good health after many years, and emphasizing the importance of basing a judgment less on the urine than on the general condition of the applicant. Then he goes on to show very clearly that men living a most injudicious life are rejected, but being disturbed by the rejection consult their family physician, receive most excellent advice and live many years in excellent health. This is a good criticism, but the Professor must remember that the men did not change their injudicious living until the life insurance doctor had refused them, and their wise decision fol-

lowed the rejection. The medical examiner cannot assume that any man having lived a reckless life for thirty or forty years is going to suddenly change to a sober, temperate one. Unfortunately, my personal experience has been that men of forty, fifty or sixty years, who have never exercised self-control in regard to their animal desires, do not change suddenly and become models of virtue. They may be frightened for a short time, try reformation, but the tendency is to return to their former habits. The Professor ends his article with this true statement: "That a trace of albumin and a few tube casts are danger signals, the red lights of danger, which may mean an open drawbridge or a wrecked road-bed ahead, and may be simple warnings for the engineer to go slow."

I can best illustrate my opinion on this subject by giving a few leaves from my experience during the past forty years.

From 1868, when I began regularly to test for albumin, until 1888, during which time I was daily engaged in making personal examinations, persons declined for albuminuria died within twelve months after their rejection, saving in losses to the company each year sufficient to pay the entire expenses of the medical department in New York City.

Let us look at the different varieties of albuminuria. First the so-called physiological albuminuria. Two partners came in for examination, both hearty, fine-looking specimens of physical vigor. Albumin was the only blemish in either case. Number one had such a faint trace that after repeated tests Dr. Edward Curtis and I thought it must be a case of the much-talked-of physiological albuminuria. The man died in eighteen months of Bright's disease. Case number two had excessive albuminuria, was rejected, but lived many years until I lost track of him. Our faith in this kind of albuminuria was badly shaken.

Secondly, let us consider the so-called cyclic or intermittent albuminuria. That such a condition is quite common is beyond dispute. A gentleman whom I had accepted a few years before came into the office one afternoon to take the largest policy the company then issued. He was a personal friend and a fine specimen of a healthy man. To my disgust and his very great annoyance I found distinct traces of albumin. He went uptown to see his family physician and was told to bring a morning specimen for examination. Nothing was found and on his way to his office he came to see me about 11 o'clock, and I could find nothing abnormal. At my request he called again about 3 P.M., with the result of albumin being distinctly present. I watched him for weeks and could always find albumin after 12 noon, but never before that hour. The man was taken by other companies and I was severely criticized. I received a long scientific explanation from an uptown expert that there was no kidney disease. The man died five years later of serous apoplexy due to disease of the

kidney, the death certificate being signed by my learned uptown expert, who stated in his death certificate that the disease had lasted to his knowledge five years. On the other hand, many have come before me presenting albumin in the urine so evidently due to temporary causes that a favorable judgment was given, the parties living many years in the best of health. Tests made at our office upon members of the medical staff show that few men pass six months without occasionally having albumin and tube casts in their urine. Cases can be given in abundance illustrating the dangers of albuminuria, but enough has been said to demonstrate the difficulties presented to the medical examiner when called upon to make a differential prognosis in albuminuria. The amount of albumin found gives no necessary evidence of possible future danger.

Thirdly, let us take up the albumin of adolescence occurring in young persons between the ages of seventeen and thirty. These cases cause less worry to the medical men, as most are temporary and the prognosis is good. The physical condition and the mode of daily life are more important factors in young subjects than the albuminuria.

In the past few years we have brought the microscope to aid us in forming a prognosis, with the result that it is confusion worse confounded. Hyaline casts abound, granular casts are not infrequent in urine free from albumin. The older the individual the more frequently do we find the various kinds of tube casts. In young subjects of both sexes having albuminous urine, the microscope often shows hyaloid bodies, usually club shaped at one end and tapering at the other, striated, somewhat larger than a tube cast, which have attached to their larger extremity a cluster of highly refractive, mononuclear, epithelial cells, about twice the size of a leucocyte. These cells, as a rule, show no granulation of the protoplasm. They are usually joined together at their smaller extremities, thus radiating from a common center. The albumin in these cases is usually transient, often disappearing in twenty-four hours. Ninety per cent. of these cases are thirty years and under, and it is extremely rare to find them in persons over forty.

What is the practical result to be drawn from this condition of the kidneys, and what is the prognosis in each case? The amount of the albumin gives no indication of the future result.

The presence of tube casts of any variety does not necessarily mean permanently diseased kidneys, as the casts are found too often in persons otherwise healthy. The most important factor, and one too often neglected, is the daily manner of the life of any individual. The worry necessary to the carrying out of large financial schemes, the habit of having too many financial operations going on at the same time, the excessive use of food highly seasoned, of great variety and containing too much nitrogen; the abuse of alcohol and tobacco, the excessive yielding to the other animal appetites, give as a natural sequence the

loss of nature's best restorer, sleep. From my experience and point of view it would seem that the prognosis depends more upon the daily mode of life than upon the findings in the urine.

#### NARCOTIC ABUSE AND THE PUBLIC WEAL.\*

BY J. B. MATTISON, M.D.,

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TWENTY-SIX years ago, in a paper, "The Impending Danger," *Medical Record*, 1876, attention was called to a situation that seemed to me ominous—weighted with peril to the public weal—in that the use of morphine had become so general that it involved the risk of this nation becoming largely one of opium inebriates. A decade later, an added risk obtained in the coming of cocaine—a drug wonderfully rich in its power for good, in some conditions, when rightly used; but with a destructive energy all its own—one unique and appalling, that may well be called diabolic, and with which no other agent for ill, save one, can compare.

During the twenty years following the publication of that paper, the high-water mark of this narcotic abuse, so fraught with danger, was reached—in my opinion—and since then there has been a steady decrease in the use of these drugs among medical men, so that a present survey makes me largely optimistic, and hopeful that in the near future, we shall note still larger decline. Why this faith within me need not detain us now. Despite adverse thinking of some, reasons good and sufficient make me think narcotic inebriety in America on the wane, and that we have come out of a condition that was critical as to the public good, because it threatened an untold number with more of sorrow—mind and body—than the world would ever know.

But while felicitating ourselves on escape from that peril, there is still cause for concern in that we are menaced by a danger, less open—but none the less real—because its fell work is done by those with whom private gain is above public good, and among those who, quite unaware of the risk lurking in these so-called, but often specious, helps to good health, find themselves, early or late, in the grip of a poisonous power they are helpless to resist.

The drift of my paper you, at once, appreciate. It is solely toward the danger involved in the lawless sale—lawless because not safe-guarded by law—of the many nostrums in which morphine and cocaine play the largest part for harm. As a nation largely neurotic—both ancestral and acquired—we offer an inviting field to venders of such wares, who ply their trade with a vigor worthy a better cause, and with result of which we must make note if we would conserve the best interest of many whose well-being is given to our care. It goes without saying that the larger,

\* Read before the American Association for the Cure of Inebriety, Boston, Dec. 18, 1902.

by far, number of the many nostrums—nervines, anti-neuralgic pills, powders, tablets and liquids—so much heralded and lauded for relief of pain and nervous unrest, have morphine as their active part. And this "part," in some is not small. In one, largely advertised, there is one-eighth gr. in each teaspoonful. The risk of morphinism, in certain persons, from that amount, is large; in fact, a smaller, in a highly nervous patient, on whom it acts kindly, will create the disease. A ten years' case of morphinism, under my care, seven years ago, had its rise in a one-sixteenth gr. daily dose.

Even larger risk of inebriety obtains in using the various nostrums containing cocaine, so much lauded for the relief of coryza and other nasal ills. In the form of catarrh snuffs and solutions, its power for harm is far greater than when taken by mouth; in fact it ranks almost—or quite—with its subdermic effect, by virtue of the highly absorptive nasal mucous membrane, and its nearness to the brain, making its seductive power and ill effect on mental health specially prompt and pernicious. One of these nostrums contains  $1\frac{7}{8}$  per cent. cocaine—two per cent. is the strength often used for anesthesia—and any "cure" having that amount is dangerous. *Insanity is certain, if its use be continued.*

Case after case of cocaineism, the genesis of which was its use by a rhinologist, has been under my care. One of the most notable—and quite unique—was during the last summer; a New England physician, who, three years ago, used it for acute coryza. It snared him, and he continued it, changing from nose to mouth, never swallowing, but holding till he felt its effect, and taking it, hourly, to extent of 24 grs. daily, till demented. The wrecks sequeling this and the more common subdermic using—the latter, mainly, among our own confrères, but now, happily, on the wane—make a sad chapter in the gruesome story of narcotic abuse during the last 15 years.

Such the situation. What the need? This:

An act, making it illegal to sell morphine or cocaine except per prescription, and the prescription not to be refilled, save by order of attending physician.

A law compelling the maker of every nostrum to print the formula on wrapper, and those containing morphine or cocaine, the amount of the drug in each dose. America is behind the times as to what could and should be done to avert this ill. The American Association for the Cure of Inebriety can, and, it is to be hoped, will, make earnest effort along this line, and so, effectively safeguard one phase of the public weal.

**Canadian Doctors Cannot Practise in South Africa.**—Three Canadian doctors, two from Ontario and one from McGill, who went to South Africa with the Canadian army medical corps, tried at the conclusion of the war to practise in the Transvaal colony. As only English diplomas were allowed there, they were prohibited from continuing, and even on appeal to Lord Milner, without success.

### THE RESULTS OF INTRAVENOUS INJECTIONS OF DILUTE FORMALIN SOLUTION IN SEPTICEMIC RABBITS.\*

BY WM. H. PARK, M.D., AND WM. A. PAYNE, M.D.,  
OF NEW YORK.

THIS work was undertaken at the Research Laboratory, Department of Health, after the report by Dr. Barrows of a case of streptococcus septicemia in which recovery had followed the injection of formalin solution. In all of our experiments, first the culture, then afterward the formalin solution were injected intravenously. Healthy unused rabbits were employed; and controls were always made. In order to roughly determine the effect of intravenous injections of formalin in rabbits, we injected a number of rabbits with varying dilutions and amounts. We found one c.c. of pure formalin to be immediately fatal; five c.c. of a one-tenth solution to produce alarming convulsions, later anemia, paralysis and death; ten c.c. of a one one-hundredth dilution to produce slight temporary disturbances with following anemia. Ten c.c., twenty c.c., thirty c.c., and fifty c.c. of a one five-thousandth solution produced no apparent immediate disturbance, but one hundred c.c. caused abortion in a pregnant rabbit a few hours afterward. This may have been due, not to the formaldehyde, but to the large amount of fluid injected. One rabbit died during the inoculation of fifty c.c. of this same dilution. As far as immediate danger is concerned, ten c.c. of a one one-hundredth dilution seems to be within the bounds of safety for a full-grown rabbit. Ten c.c. of a one two-hundredth dilution given a young rabbit was followed by a pronounced edema of both ears. Rabbits receiving large amounts of formalin showed after two to three weeks emaciation and pronounced anemia.

The quantity of formalin which could safely be given having been determined we injected a number of rabbits intravenously with from one to ten c.c. of an ascitic broth culture of two strains of slightly virulent streptococci recently obtained from human blood, an amount sufficient to kill probably in from one to four days. Of each set of rabbits a certain proportion after inoculation received intravenous injection of formalin solution. About half of the rabbits injected are presented on the following table. The results in the others were similar. One rabbit which received one hundred c.c. of a one five-thousandth solution of formalin, twenty-four hours before the streptococcus, lived considerably longer than the controls.

The slight virulence of the streptococci in the above series of experiments hampered us in deducting conclusions as to the amount of protection which would be afforded in case fewer but more virulent streptococci had been employed; but these experiments certainly demonstrate that after even large doses of formalin the streptococci can still increase in the blood and

\* Read before the New York Pathological Society, Feb. 11, 1903.

cause death through septicemia. All the rabbits receiving formalin after the streptococcus died before those receiving the streptococcus alone. In the other table we show another series of rabbits which were injected with a virulent culture of pneumococcus sent to us by Dr. Wadsworth. Here, as before, with the streptococci, the formalin failed to give the least protection. Table II gives the results in eight rabbits, four of which received the formalin dilutions after the pneumococci.

Table I.—Showing results of intravenous injection of dilute formalin solution in rabbits, one to two hours after infection with streptococci from cultures A and B.

RABBIT EXPERIMENT NUMBER	AMOUNT OF CULTURE INJECTED	AMOUNT OF FORMALIN INJECTED	DURATION OF LIFE	SMears AND CULTURES AT DEATH SHOWN IN BLOOD
1	10 c. c. A	50 c. c. 1-5,000 sol.	18 hours	Abundant streptococci
1	10 c. c. A	Control; no formalin	22 hours	Abundant streptococci
1	10 c. c. A	Control; no formalin	24 hours	Abundant streptococci
2	10 c. c. B	10 c. c., 1-200 sol.	6 days	Abundant streptococci
2	10 c. c. B	10 c. c. normal salt solution	15 days	Abundant streptococci
2	10 c. c. B	Control	10 days	Abundant streptococci

Table II.—Showing results of intravenous injections of formalin solution in rabbits within one hour after the injection of a surely fatal dose of a virulent pneumococcus. A got pneumococci alone; B got pneumococci and later formalin solution.

RABBIT EXPERIMENT AND AMOUNT OF CULTURE USED	AMOUNT AND DILUTION OF FORMALIN USED	TIME OF FORM. INJ.	DURATION OF LIFE	SMears and cultures at death showed in blood abundant pneumococci.
1 1 c. c.	None		1 day	
1 1 c. c.	5 c. c., 1-100	1 hour after	1 day	
2 5 c. c.	None*		3 days	
2 5 c. c.	5 c. c., 1-100	Immediate	2 days	
3 5 c. c.	None		4 days	
3 5 c. c.	15 c. c., 1-100	1 hour after	2 days	
4 1 c. c.	None		3 days	
4 1 c. c.	10 c. c., 1-1000	30 mins. after	2 days	

\* Received 5 c. c. of normal salt solution.

From the tables it is seen that the injections of formalin were given in some cases equal to and in others far beyond the comparable dose advised by Barrows in man, and yet these rabbits died uniformly before the controls. Although these experiments are limited in number, yet they are so uniform in their outcome, that it seems fair to assume that non-lethal formalin injections can-

not stop a septicemia already started in healthy animals. The results of Fortesque and Bricksdale, published just as we were finishing these tests, agree in every point with ours. They used anthrax bacilli and streptococci. (*Lancet*, January 10, 1903).

During these experiments streptococci have been obtained, either by Dr. Wilson or Dr. Poor, from the blood of four cases of streptococcus septicemia in man. Each of these cases received two or more intravenous injections of from 500 to 750 c.c. of a one five-thousandth solution of formalin. Streptococci were found in the blood of two of the cases the day after the formalin injection. In the other two cases no cultures were made. All four died. Their deaths took place in from five days to three weeks after the injection of formalin solution. In the blood of these cases the streptococci were present to the extent of 4 to 25 per c.c. and were thereafter probably more abundant than in the Barrows case where, according to the report from the Cornell Laboratory, a growth of streptococci occurred in only one of the three lots of broth inoculated with the patient's blood.

The experiments reported here and elsewhere, and the fatal outcome of septicemia in man after diluted formalin injections should cause us to be guarded in using formalin, and make it necessary to weigh each case injected not only to determine when improvement ensues whether recovery has been promoted, but also when death occurs as to whether harm has been done. An intravenous injection of water plus sodium chloride may prove better than water plus formalin.

#### EXPERT EVIDENCE: A REPLY TO HON. JOHN WOODWARD.\*

BY WILLIAM LEE HOWARD, M.D.,  
OF BALTIMORE, MD.

JUSTICE WOODWARD's criticism of expert testimony,\* his statement: "So notorious is it (the abuse of expert testimony) becoming that, if it is not checked, it seems to me a reaction must inevitably come that will abolish such testimony altogether," contains so much truth from the legal side, and so few facts from the medical side, that it calls for a reply from the physician.

The low estimate in which the medical expert is held, the disrepute into which he has fallen, and the seemingly commercial basis on which he is placed, is partly due to the members of the Bar. My profession is by no means guiltless of assistance in bringing about this deplorable state, but has, by its indifference, or through its lack of a national educational standard, allowed individuals to pose in courts as representatives of progressive medicine, when in reality, many have been those who seek the notoriety and emoluments accompanying such temporary false standing. But as I shall show further on, the legal profession can do much to rectify the present status of the

\* Expert Evidence, by Hon. John Woodward, Justice of the Appellate Division of the Supreme Court of New York.—*North American Review*, October, 1902.

medical expert, and look to it that honorable men are treated honorably. When this occurs experts can be found who will be respected and believed, justice aided, and forensic medicine again takes its place as one of the highest offices for the protection of honor and life. Let the lawyer once understand that medical men do not always recognize the maxim: "*Justitia non novit patrem, nec matrem, solum veritatem spectat justitia*," and that the reputable physician cannot at all times and under all circumstances subscribe to the legal principle: "*Lex non fovet votis delictorum*," and he will gain an insight to the reason for the difference between the working of the medical and legal mind.

There is a feeling among medical men that the legal mind is not always in sympathy with the fine and delicate problems presented to the physician in the sick chamber and on the witness stand. The lawyer often demands facts which the medical man considers sacred secrets, and it is frequently the bullyragging—which unfortunately in some cases the Bench allows—that the medical witness is subjected to, that makes him an unsatisfactory and unwilling witness. He is often accused of withholding evidence and clogging the wheels of justice, when in fact, he is endeavoring to be faithful to his trusts—his patients. In ethical matters the physician and lawyer speak two languages.

In some respects the legal opinions governing the practice of medicine in the United States do not differ from those of the time of Henry VIII, for up to that period the common law of England did not recognize the inability of the public to discriminate between the qualified and unqualified practitioner of medicine. Practically this is true of the United States so far as allowing a jury composed of men of varied education and diverse environmental conditions to pass upon the statements of opinion of the medical expert. That is, these twelve men of dubious scientific knowledge are to judge between the value of the opinions of a man whose alma mater is a public school and whose diploma as a doctor of medicine was granted after a two years' course of seven months each, and that of a man who has spent a life of study and preparation in school, at college, and the university. Legally—thanks to the bewildering statutory laws—both have an equal standing in court and each may hold the impressive title of professor. A recognized national standard of medical education and a Minister of Medicine in the Presidential cabinet are absolutely necessary in order to clear up this chaotic condition. "In the United States the legislation of each state has authority to prescribe qualifications which must be possessed by those practising medicine and surgery within its borders and it may be said without exception that the legislation of each state has exercised this right to a more or less degree."—Taylor.

There is at present great effort being made by medical men to force a standard for medical education, and considerable progress has been made

along this line, although there still exists a tendency among a certain class of medical colleges to evade this standard by resort to technical methods and tricks known to the unscrupulous. It is unnecessary here to bore the reader with the worn out platitudes of the honesty of both professions, but we must face facts which are well recognized by physicians, although seldom given publicity through fear of offending the innocent.

Prof. R. A. Witthaus justly declares that one of the reasons expert witnesses are in bad repute, is: "The employment of blatant, ignorant persons, or even persons who do not hesitate at plain perjury." Such will always be the case until the unscrupulous and uneducated men are driven out of the profession. This can only be accomplished by having a national standard of education. This standard must be high. The candidate for the medical college must be one who has mentally and morally been tested by years of preparatory study—not a two years' course, and then receive a baccalaureate degree. This is the only remedy on the medical side for the disgraceful status of the medical witness to-day, a condition which indirectly is a stigma on the profession of medicine.

The American Medical Association is constantly endeavoring to bring about a satisfactory standard of medical education, forcing those medical schools which have no excuse for existence save a commercial one, to adopt a standard of education for entrance, and to make compulsory a four years' course. Progress has been made along this line, and the last five years have shown a marked improvement in the education and personnel of the medical student. It is often forgotten by the average juror that the moral make-up of the expert has as much to do with the value of his testimony as his technical knowledge, and it is this mental attitude of the juror that has thrown a pall of distrust around all medical experts, and which has made it difficult to get men of honor and self respect to go on the witness stand; many of the large hospitals and real universities having an unwritten law to the effect that physicians connected with the same shall not be employed by lawyers seeking medical testimony in damage cases. This state of affairs is caused by the number of unscrupulous lawyers—ambulance chasing solicitors—that swarm around the courts of every city like struggling gnats. It is the purely commercial spirit that governs these shysters which makes them a menace to justice, a drag on the legitimate business of the courts, and is certain to cast a ray of suspicion upon the physicians they employ as experts. If the courts do not take cognizance of these persons, the physician will. Already too many have suffered innocently from these legal parasites.

In many States the candidate for the practice of medicine must exhibit a diploma from a recognized college having a three years' or four years' course before he can be licensed by a State board of examiners. In some States he is not required

to have a diploma from a medical college, but only to pass an examination by a State board. "In some States it is provided that he shall never have been convicted of a felony."—*Taylor*. It has been decided—*People vs. Rice*—that an unlicensed physician may testify as a medical expert, yet the laws of the State of New York make it a misdemeanor to practice without a license. The New York Court of Appeals in passing upon the question of the non-licensed expert, used the following language, Chief Judge Alton B. Parker writing the opinions: "After a careful consideration of the subject we have reached the conclusion, that if a man be in reality an expert upon any given subject belonging to the domain of medicine, his opinion may be received by the Court, although he has not a license to practise medicine." Justice Woodward in his article has this to say: "An expert is a specialist, the value of whose evidence given in the form of opinion, is proportioned to his character, to his reputation for honesty in the community, and to his standing in his specialty or profession."—Page 488.

According to the legal citations above, an osteopath with a large following could give satisfactory evidence of having all the qualifications demanded by Judge Alton B. Parker, while a "natural bone setter" without legal authority to practice medicine, possesses all the knowledge necessary to contradict the opinions of an honorable professor of anatomy in one of our large universities, and furthermore, there can be found members of the Bar who will gleefully assert this fact in court. Again, thousands of men and women can be found who will claim that Mrs. Eddy's knowledge of diseases places her as an expert far above any regular physician, and that she more than fulfils Justice Woodward's demands in her "reputation for honesty in the community" and to her "standing in" her "specialty or profession."

It would be surplusage to parallel further, but it is on account of this uncertainty of the company the regular physician will be pitted against, that frequently causes him to avoid giving his valuable opinion in court. Nor is it entirely due to the admittance of the irregular practitioner in court, but frequently to the opposing side who have hired a "professor" whose reputation cannot be openly assailed, yet whose unsavory odor has penetrated the sensitive ethical rules of the medical society. This man is a professor in a medical college, has a legal right to be called an expert, will have a large following, and by the public will be placed on the same educational standard as the reputable man. But there is a great gulf between them, they can seldom meet on the same scientific ground. The man who has gone from school to college, from college to university and from university to the hospital, is, thanks to our lenient, and often farcical statutory laws, discourteously contradicted on the witness stand by a man who has jumped from the soda water counter to a two years' course in an easy-going medical

school. Such are a few of the conditions which have driven honest physicians from the courtroom. There are others—the fault of the Bench and Bar—the impertinent questions, discourtesy, and the misleading and senseless hypothetical questions emanating from a certain class of lawyers.

It is the long and tangled hypothetical question put to the expert witness that displays the misunderstanding of the lawyers and apparently makes a fool of the doctor. Questions are asked to make the unexplainable explainable, while the jury is not told that the physician deals with conditions that are continually furnishing exceptions to general rules. If the doctor on the stand tries to explain this fact he is told to stop, and confine his statements to his opinions based on the hypothetical question. Says the Hon. Wm. B. Hornblower: "Expert testimony based upon one-sided hypothetical questions is almost of necessity favorable to the questioner, and the seeming inconsistency of expert witnesses of equal ability is largely due to this mode of questioning." The jury and the press do not consider that physicians of equal intelligence and education may as honestly differ upon one or more series of questions put to them by a layman, as may the opposing attorneys in an interpretation of a proposition in law. The medical man now realizes his anomalous position as a witness, the false attitude he is placed in, and the impossibility of being allowed to tell the truth as he understands it. Opinion witnesses receive unfair treatment from lawyers who take cases not for the truth that is in them but for the lies that can be put into them. The physician knows it would be possible to establish a reasonable degree of truth were not everything done to prevent it. The expert realizes that he is permitted to know only one side of the question as it affects the interest of the parties who call him. Let him have without reserve the facts from both sides. Give him an opportunity to consult with the expert for the other side, then even if they disagree in opinion they will most surely agree on facts. But to this mutual consultation lawyers will not agree. They will not, especially in damage cases, place in the possession of opposing counsel any information which they may wish to use for their own side. This may be ethical from the legal viewpoint, but to the doctor it looks like injustice. Physicians are not in the habit of looking on one side only in their investigations and studies, hence this attitude of the lawyers has driven conscientious men away from the courts. It is essential that an expert witness should be made as familiar with all the facts appertaining to a case in which he is to testify, as that the attorneys should know the whole of their case before trial. "The element of judgment and opinion must be based upon the same facts as those of the lawyer, and upon these our interpretations must rest."—*W. P. Giddings, M.D.*

McKelway tritely says: "It is the lawyers who have brought expert testimony into disrepute,

and who to a degree have brought their own profession into disrepute by the arts which they have practised for the concealment or destruction of truth rather than for its disclosures and denotement."—*Albany Med. Annals*, Oct., 1898.

When the physician has clearly in his mind the case as he views it, has formulated his opinions as based upon facts, and would give them to the jury regardless of the consequences to the side employing him, he is partially gagged by the surprised lawyer who only wants such opinions as will win his case—not the truth. The only logical method for the medical witness is to state in sequence his conclusions, the reasons for them and the conditions which might change or modify them, but he is not allowed to so proceed; and, humiliated, with the feeling of loss of self-respect, and conscious of having been placed in a false light, he leaves the stand swearing never to be used again as an expert. He seldom is, for when the lawyer trumps up another damage case he looks around for a more pliable tool whose opinion will coincide with his own. And this is the way he will proceed: He goes from physician to physician, giving his side of the case, insinuating in manner, and elastic with facts. He pays the fee for consultation—sometimes, and as each physician retains the secret of the consulting room the lawyer consults many with impunity until he finds one whose opinion can be readily molded into the attorney's shape. Now we see the medical expert made to order. These are facts well known to men of both professions. Mather wrote: "The expert witness is not called to tell what he knows, but what he thinks." In truth he is not wanted to-day for what he thinks, but to tell what he thinks his employer thinks.

A little attention on the part of the legal profession would disbar this unscrupulous lawyer who makes flattering offers, insinuating pleas and indirect bribes to his medical fellow in perjury. Let the legal profession get rid of the Bar bullies and shysters and the medical profession will have fewer scamps. The Supreme Bench has here work to do. Are maintenance, barratry and champerty no longer punishable?

In quoting Jones,\* Justice Woodward tells a tale only too well known to the public: "The notorious fact that experts of equal credibility and skill are found, in almost every cause, testifying to directly opposite conclusions, illustrates both the fallibility of such testimony and the fact that a conviction for perjury based upon such evidence would be very difficult." It is the training the legal mind receives along the line of precedents, of relying upon facts established in passed decades, of reference to aged decisions and immovable tradition, and of reference to ancient rules of procedure, that causes the lawyer to denounce as unreliable one or all of the experts who differ radically in their opinions, and who seem, to the lay observer, to give each other the lie direct. Because two medical men of rigidly honest intentions contradict each other in the

answers to some hypothetical question put to them on examination, does not convey any idea of perjury or dishonesty to the scientist.

In no branch of the sciences has there been such rapid progress as in that of medicine the last ten years. Hourly, daily, new theories are replacing the old, and what was thought the truth yesterday, is to-day sworn to be a fallacy. Statements are made daily in medical societies which have their confident supporters and likewise their bold deniers. The new ideas are discussed pro and con with honest intentions and faithful adherence, yet there is no display of acrimony, never an idea that your opponent is a liar. When a member of the Bar wishes to consult some legal authority he refers to an ancient tome that his father, or perhaps his grandfather, was accustomed to quote. Let a medical man refer to a work that has been five years on his shelf, or let him rely on his text-books of student days, and he will without doubt be flatly contradicted by a wiser man when the two meet in court. Both will be equally honest and sincere in their statements, but the wiser man can give facts regarding recent discoveries which will cast doubt in the minds of the jury upon the statements of his confrère. This is one of the reasons why medical men do not believe experts have any place in trial by jury. Again, regarding a medical question, two men may give greatly divergent opinions, and both be giving their honest opinions. There is at present so much uncertainty in certain branches of medicine, especially in psychological physiology, that it is a bold man who undertakes to nail down his fact so it cannot be displaced. In referring to a statement of a physician that it would be an easy matter to get half a dozen competent medical men who, in answer to a hypothetical question put by the District Attorney, would give quite exactly opposite answers, Justice Woodward remarks: "Is not the remedy for these frequent, and after all infrequent, instances of professional dishonor in the hands of the medical profession itself?" No; it is in the hands of the legal profession, some of whose members keep a morally weak physician on a retaining fee, or, more often share with him the small sums they can obtain by verdicts in damage cases; or by unscrupulous "bluffing" where there is no case. It is the lawyer in these cases who is the suborner, the physician the flaccid tool and perjurer. Is a suborner any less guilty than the perjurer? Justice Woodward would have the latter expelled from the medical society,—a very difficult matter, as is well known by those familiar with medical cliques and the humiliating jealousy therein existing—but would it not behoove the Bench and Bar to pluck out its own beam? In all large cities the number of lawyers who throw tempting bait to the struggling young physician is steadily increasing, and it is safe to say that once in the hands of these legal pirates the physician is lost to all sense of self-assertion. So notorious have these legal parasites become that the Baltimore *Evening*

\* "The Law of Evidence in Civil Cases," by Burr W. Jones.

*News* has been editorially stimulated to make the following remarks:

"Ambulance-chasing" lawyers and their side partners, the "runners," are becoming more numerous every day in Baltimore. Frequently now dim hints at their methods are made in court. Vexatious damage suits are being promoted in Baltimore to an extent never known before. It is a growing abuse of great proportions, in which the taxpayers are interested directly.

"All of Baltimore law-courts are behind with their work. This is largely due to the pernicious activity of the damage-suit lawyers. At least one-half of the suits that go to the trial dockets of the law-courts are damage suits for alleged injuries to persons or property. It is probable that an investigation would show that four-fifths of the docketed suits which ultimately call for trial are of this sort. The majority of such suits are worked up by "ambulance-chasing" lawyers and "runners," and have very slight foundation. Yet this pressure of frivolous litigation will very soon make necessary an additional judge, with bailiffs, clerks, deputy sheriffs, jurors and all the paraphernalia of a court. It costs about \$60 a day to conduct a court with a jury, and the public will have the pleasure of paying that additional amount to aid "ambulance-chasing" lawyers in "plugging" corporations and individuals. That is about what it amounts to. In the meantime, legitimate litigation will have to wait."

I have briefly outlined some of the salient points or difference between the medical and legal methods of thinking, and the difficulties which present themselves whenever an attempt is made to settle the much-discussed "Medical Expert Testimony" question. From the medical viewpoint there seems to be no reason why the experts of both sides could not have a conference before the trial in order that they might come to some mutual understanding, or formulate a joint opinion. Such a procedure would further the ends of justice and save expense to the State. Another plan which seems feasible would be to have the expert an officer of the court, similiar to a court surveyor as exists in some States. Maine has a court surveyor to give evidence in cases of disputed land boundaries. When no agreement as to facts has been reached, the Court, upon request, selects a court surveyor, who when asked, goes over the disputed boundaries, and identifies marks and bounds, and makes his official report. Whichever side asks for his appointment pays the expense. But to any such procedure of saving time and expense; of any method which will hasten the ends of justice and put a stop to disgraceful bickerings and disputes, the legal cry of "unconstitutional," "jeopardizes the rights of the defendant," "impossible under our rules of procedure" and other stereotyped expressions arise which makes the medical man wonder at the immovability of the law's progressiveness. Until the legal profession allows us certain concessions, until it modifies the rules of the admissibility of evidence in criminal proce-

dures, so that the expert witness may have the protection which rightly belongs to him, there will always be difficulty in getting medical men of probity and honor to dignify the witness stand with their presence at criminal trials.

## MEDICAL PROGRESS.

### MEDICINE.

**Human and Bovine Tuberculosis.**—This knotty problem is attacked once more by NATHAN RAW (Brit. Med. Jour., Jan. 31, 1903), in a preliminary communication which recounts his experiments and presents the following conclusions: (1) That there are two distinct varieties of tuberculosis affecting the human body, one produced by human tubercle, the other by bovine; (2) that these two forms are separate and distinct; (3) that bovine tuberculosis may set up *Tuberculosis mesenterica* in children; (4) that bovine tuberculosis is probably the cause of enlarged lymph glands, tuberculous joints and lupus; (5) that pulmonary tuberculosis is not due to bovine infection but to human.

**The Etiology of Acute Rheumatism.**—Many hypotheses have been advanced to explain this and other closely allied joint conditions, but the present state of our knowledge is summed up by the conclusion that a small micrococcus, absolutely distinct from that of ordinary septicemia, is the cause of this well-known train of symptoms. R. M. BEATON and E. W. A. WALKER (Brit. Med. Jour., Jan. 31, 1903) believe that the coccus which they have isolated from rheumatic cases, is identical with that obtained by Triboulet, Wassermann, Paine, Poynton, and others. The slight variations in the descriptions given by these observers are probably due to variations in technic. The organism is a tiny micrococcus arranged in pairs and short chains. It is not decolorized by Gram's method. It stains well with all the ordinary dyes. It is not capsulated. It does not agglutinate. When this diplococcus is injected into an animal, characteristic and positive results are to be expected. There is fever, wasting, mono-arthritis, polyarthritis, paresis of limbs, pericarditis, endocarditis, septicemia and death. Some rabbits have two or three attacks of acute arthritis following successive inoculation and in one case, now doing well, the disorder was successfully induced four times. If an excessive dose be given, death occurs within 48 hours, the post mortem usually revealing a large pericardial effusion, often pleural effusion and cardiac engorgement with vegetations upon the mitral and tricuspid segments. The joints are very hyperemic and may contain a clear effusion. The organism is found in pure culture in the blood in all the exudations and in the urine. In moderately large doses death may occur in from three to seven days or as late as three weeks. The autopsy shows the effusions to have become turbid or purulent. Small doses produce conditions in animals which are closely identical with what is usually known as acute rheumatism in man. The heart lesions, however, can rarely be made permanent, as occasionally happens in us. Nor have the observers seen a true chorea result even in the case of young animals. Their conclusions seem positively to indicate that the bacterial specificity of acute rheumatism has been positively established.

**Persistent Jaundice.**—A most remarkable case in which a general icterus has been present for fifty years, is reported by W. T. COCKING (Quart. Med. Jour., Yorkshire, Feb., 1903). The patient stated that she had been afflicted until the present since three weeks old

and at various times has had attacks of "biliary colic" when the jaundice would get worse. The cause of the condition was not obvious, but the symptoms and physical signs pointed to partial obstruction of the common duct possibly congenital. The latter, however, is usually fatal in a few weeks. Operation for exploration was refused.

**Complications Attending Use of Antitoxin.**—That peculiar idiosyncrasy toward diphtheria antitoxin may be manifested by certain patients is shown by the report of a case by A. RECKLES (*Quart. Med. Jour.*, Yorkshire, Feb., 1903). He gave 4,000 units of antitoxin to a woman suffering from diphtheria of the throat. A few days later convalescence was established but a severe urticaria set in. A sudden attack of dyspnea, with lividity and pain around the heart then came on and suggested angina pectoris. This, however, could be ruled out and it seemed that the serum was at fault. In the next few days, nine successive attacks occurred and then recovery was uneventful. It was later found out that two years previously she had been given antitoxin for diphtheria and similar symptoms of dyspnea and lividity were noted.

**Hepatoptosis.**—The errors in diagnosing obscure abdominal tumors will never be fully known, remarks IRVING MILLER (*Amer. Jour. of Obstet.*, Feb., 1903), inasmuch as the surgeon always falls back on the exploratory incision to supplement his deficiency in diagnostic technic, and seldom looks the least bit perturbed, however far from the true condition he may have been. The following case will show how easily the diagnosis may escape one. Examination showed a tumor in the right flank easily moved to the median line, and down in the iliac fossa on the right side. The edge of the hand is easily insinuated between the tumor and the ribs neither does the mass rise with inspiration. The tumor is convex and was thought to possess a decided kidney shape, though large. There was no sharp border to be felt. Later the kidney was made out. A later examination showed the mass to be globular and not so mobile as at the first examination. Tumor of the gall-bladder was now thought of and an exploratory incision was decided upon. Examination of the mass after the abdomen was opened showed it to be the liver and that, not at all enlarged. Diagnosis, floating liver.

**Malarial Vertigo.**—Although this symptom may be markedly accentuated, it has, according to T. J. MAYS (*Jour. Am. Med. Assoc.*, Feb. 7, 1903), been noticed by few recent writers. From a study of his own cases the author has often found that in apparent good health intermittent daily attacks appear, marked by dizziness and unsteady gait. Persistent headaches and backaches are present, together with depression of spirits and exhaustion. In all cases there was a well-defined history of intermittent fever, which may have been latent for some time. Best treatment is quinine in doses, sufficient to produce ringing in the ears. May be combined with strychnine, blue mass and capsicum.

**Mortality in Pertussis.**—The commonly accepted opinion as to the fatality of whooping-cough is erroneous, but the dangerous character of the disease, especially among infants, is becoming better recognized. M. H. HULL (*Phil. Med. Jour.*, Feb. 7, 1903) reports five fatal cases in an epidemic at an orphanage in Atlanta, Ga., and collected 55 cases in a period of two years which ended fatally. In the author's cases, the complications which only existed in some, were not the primary cause of death. The danger signal, particularly in young infants, was either a developing stupor or an attack of prostration from which they recovered temporarily, to go into a state of increasing stupor and exhaustion until death. In studying the

larger series of fatal cases it was found that a catarrhal affection of the mucous membrane is the most probable complication and liable to prove the most fatal by lowering the resistance of the body to the toxic effects of the infection. Average age of the fatal cases was less than one year and duration three weeks. Most of the deaths occurred between April and September. As to the etiology, the author thinks that the characteristic lesion is a bronchial catarrh, caused by the specific micro-organism, the toxin of which acts principally on the nerve centers. The treatment comprises (1) support of the patient by tonics and stimulants, by plenty of fresh air and good food; (2) the establishment of an equilibrium in the nerve centers, also by tonics, iron and quinine, and by nerve sedatives; (3) prevention of the further absorption of toxins by destroying the micro-organism producing them—probably best done by antiseptic sprays.

**Postimpetiginous Nephritis in Infants.**—Five cases of nephritis occurring in children, in which the kidney lesion seemed to be directly traceable to the skin affection, are reported by A. FILIA (*Policlin.*, Feb. 14, 1903). In the author's belief, the eczematous lesion opened the way for the transmission of infection through the lymphatics, thence into the general circulation and to the kidneys. That this was so seemed probable from the fact that the same organisms (staphylococci and streptococci) found in the diseased skin, were also present in the urine; and these persisted some time after albumin and casts were no longer present. It was shown, through injections into animals of cultures of staphylococci found in such urine, that the organisms had acquired a high degree of virulence compared to staphylococcal cultures from other sources. This is in accord with the experimental experience that the addition of urine to ordinary culture media increases the pathogenic power of organisms so cultivated. Examination of the blood of the animals which had received the injections, showed staphylococcal septicemia in twenty-four cases out of thirty-three.

**Prognosis in Tuberculosis.**—The prognostic value of tubercle bacilli in sputum as manifested in quantitative changes is commented on by L. BROWN (*Jour. Am. Med. Assoc.*, Feb. 21, 1903). He has examined a large number of cases at the Adirondack Sanitarium. In 169 cases with tubercle bacilli, 42 per cent. had lost their bacilli on discharge,—of the incipient cases 75 per cent. were apparently cured and of the advanced, only 19 per cent. This shows the better prognosis for the early cases. Other observations also prove that one specimen proves little or nothing in regard to prognosis. If the number of bacilli steadily decrease in a series of examinations at intervals sufficiently long, the patient may be improving, but the constitutional symptoms and local signs give much more accurate information. If on repeated examinations large quantities of tubercle bacilli are found, the disease has probably advanced to cavitation. Repeated observations seem to show that the morphology of the tubercle bacilli affords little or no ground for prognosis, but the short bacilli are suggestive of a more active process. The arrangement in clumps is more apt to be found in the severer cases, but may occur in all.

**Blood Investigations in Syphilis.**—As a continuation of their researches on the iron contents of the blood in the early stages of syphilis, G. LOWENBACH and M. OFFENHEIM (*Deut. Arch. f. klin. Med.*, Vol. 75, Nos. 1 and 2) have lately published the results of their investigations of the same character in the later forms of the disease. Included are gummata and specific ulceration more particularly of the skin, bones and mucous membranes. They found a marked reduction

from the normal in the quantities of both iron and hemoglobin, neither condition being influenced by therapeutic measures. The number of red and white cells varies within normal bounds. The authors were unable to verify the differential diagnosis of syphilis by the variations in hemoglobin after the administration of mercury as proposed by Justus.

#### Blood Changes Due to Syphilis and Mercury.—

An extensive series of observations with especial reference to their diagnostic value has been made on the hemoglobin contents of the blood of syphilitics by J. JUSTUS (Deut. Arch. f. klin. Med., Vol. 75, No. 1). Over 500 cases of all varieties are included, treated and untreated. He finds that untreated cases of syphilis show a diminution of hemoglobin which lasts a longer or shorter time, depending on the severity of the disease. A gradual increase then takes place as the signs of syphilis subside. If a therapeutic dose of mercury is introduced into the affected organism by injection or inunction, a relatively sudden decrease of the hemoglobin content is observed. ( $10^{\circ}$  to  $20^{\circ}$  in the Gower's or Fleischl's hemoglobinometer.) This sinking may again be compensated for in the course of a few days, depending on the severity of the symptoms and the general condition of the patient. If the treatment is continued the hemoglobin may reach a higher point than before the former was inaugurated, and the point when no further decrease takes place marks the period when healing of the specific lesions begins. It is further claimed that the changes in hemoglobin values just noted are only to be found in the blood of florid syphilitic patients and have not been observed in health or in any other disease. The reaction can be also found when invasion of distant lymph glands takes place and in all varieties of the disease. It disappears when the syphilitic lesions disappear, but can again be demonstrated if any recurrence takes place. In using the test for diagnostic purposes, care must be taken to employ the proper dose of mercury, at least 3 grams of the official blue ointment for adults, by inunction. Administration by mouth is not effective, because of the gradual absorption. Observations should be made the morning after the inunction. Subcutaneous injection of mercury bichloride (0.05 gm.) should be followed by observation eight to nine hours later. The author prefers the Gower hemoglobinometer modified by Sahli. A diminution of five degrees or more in the latter instrument indicates the presence of a florid syphilis. In secondary and tertiary syphilis the same result obtains provided the specific lesions have not undergone involution. A negative result is not therefore diagnostic of the absence of the disease (at some previous time). The author finds, from a study of all cases where the test was properly applied, a positive result in from 70 to 80 per cent. of all doubtful cases.

#### SURGERY.

**Resection of the Common Bile Duct.**—This operation, combined with hepaticoduodenostomy, is claimed by H. KEHR (Münch. med. Woch., Jan. 20, 1903) to be the first one recorded. The patient, a man of fifty-three years, presented an annular carcinoma of the common duct, which necessitated resection of almost its entire length. The gall-bladder had also to be removed and the hepatic duct was sutured to the duodenum a short distance from the stump of the common duct, which was simply tied off. A small bit of omentum was then sutured to the point of entrance of the anastomosis, the wound sewed up except for exit of small tampon. There was a slight discharge of bile for a time, but the patient made a good recovery. He discusses the clinical differences between carcinoma

and stone of the common duct and believes that carcinoma is more frequent in men than in women, there is seldom colic and usually icterus begins very gradually, but becomes intense and regular. The stools are usually clay colored. The duration of the disease is usually about six months for cancer, whereas with stone it may extend over a long period, even up to twelve years. Chills and fever are rare in carcinoma, cachexia is marked, the gall-bladder is large and palpable (80 per cent.). Ascites is ordinarily present. The good results obtained lead the author to extend surgical intervention to include cancers of the common duct and to recommend operation in cases of chronic icterus which suggests an obstacle in the common duct or pancreas in hope that it may be a case of chronic pancreatitis.

**Treatment of Fracture.**—The following details of treatment of fracture are offered by Dr. BORCHARD (Z'blatt f. Chir., Jan. 31, 1903). Massage is begun on the day of injury. Then application of splints and immobilization of the broken ends in exact position after the disappearance of the swelling and from the beginning of callus formation up to the time of consolidation, which prevents the displacement of the bone fragments, excepting with great force. This lasts perhaps twenty-six days, and is followed by massage and gentle movement of the joints, until union is formed. Finally, voluntary movement is allowed. The aims are to prevent stiffness of the joints, atrophy of the muscles, and a late edema as soon as normal position is resumed.

**Needle Holders.**—The shops of instrument makers exhibit great numbers of needle holders, many of which are complicated and fall short of their purpose. Lately several have been devised upon the principle of two V-shaped notches grasping the needle from opposite sides. Their form permits any size of needle within the ordinary range of surgical needles to be grasped, necessarily at one point of the holder. The following modification of Hegar's has just been brought out by G. BURCKHART (Z'blatt f. Gyn., Feb. 7, 1903). It consists of a long and a short jaw. The long jaw makes up the tip of the instrument and is so cut that two surfaces at right angles to each other mark its inner aspect. One of these surfaces runs along the whole jaw, up to the base of the tip, where it is joined by a very short surface. Against this shorter surface the needle is held by the tip of the short jaw, which is ground off at an angle, thereby repeating the principle alluded to above, namely, of giving a V-shaped, variable notch, in which the needle is held, and permitting any size of needle within the ordinary range to be held within the same point of the instrument. So simple an arrangement will commend itself to most operators.

**Appendicitis in its Acutest Forms.**—The treatment of this disease is probably more important than the diagnosis, which has come to be so much a matter of general familiarity as no longer to be overlooked as ordinarily as formerly. J. A. MACDOUGALL (Lancet, Feb. 21, 1903) says, as to treatment, that he holds opium to be undesirable, because it masks the guiding symptoms. When unavoidable, a suppository or laudanum by rectal injection is better than morphine subcutaneously. When evacuation of the bowels is necessary, and it often is, enemata are preferable to cathartics by mouth. The method of operation in these cases done early, that is, within the first forty-eight hours, is, as a rule, straightforward and simple. Simplicity and safety, he thinks, are gained by making the incision more close to the anterior superior spine of the ilium than is usually advised. It is possible to display a removed diseased appendix without any protrusion

of the small intestine. He has, as a rule, greater trust in sponges and swabs than in irrigation, and in drainage tubes of large size, with gauze wicks than in gauze packing. The later treatment of bad cases is better managed with normal salt solution, used subcutaneously, both as a cardiac stimulant and as a means of overcoming the poisonous material within the system, by increasing its elimination through the skin and kidneys.

**Improvement of General Anesthesia.**—The improvement on the basis of Schleich's principles with special reference to anesthol is discussed in a most interesting paper by WILLY MEYER (Jour. Am. Med. Assoc., Feb. 28, 1903). The effort heretofore has been directed not only to the discovery of a new and less dangerous narcotic but also to improve the chemical conditions of the known anesthetics by making them absolutely pure. Schleich's investigations were conducted on an entirely different plan and he started to find an anesthetic of which the boiling point would correspond to the body temperature, substituting a physical for the chemical basis, so that the amount eliminated during expiration would almost equal that absorbed during the previous inspiration. He finally devised an apparently suitable mixture of ether, chloroform and petroleic ether (benzine). Meyer made a series of trials with this mixture, and although fairly good results were had, substituted finally for the petroleic ether, ethyl chloride and called the product anesthol. It contains ethyl chloride 17 per cent., chloroform 35.89 per cent. and of ether 47.10 per cent., representing a proportion of about 1:2:3. Its boiling point is 104°F. Meyer has used it in many cases for four years past and is very well satisfied with it. It should be given by the drop method with an Esmarch mask. The patients do not struggle, the pulse does not vary much, but respiration at times becomes shallow. The anesthesia caused is not very deep and some of the reflexes may not be lost. In abdominal cases, therefore, morphine, gr.  $\frac{1}{12}$  to  $\frac{1}{4}$ , may be given by hypo about half an hour before operation with excellent results. Salivation and cyanosis are absent and the awakening is quick. Vomiting varies, but is never persistent. Other sequelæ are rarely met with. Two deaths are reported, both severe kidney operations and with marked shock, not especially due to the anesthetic.

**Actinomycosis in Man.**—The following are offered by R. VON BARACZ (Arch. f. klin. Chir., B. 68, H. 4): (1) Ray-fungus should be regarded as a special and peculiar fungus, and not as a collective name for a variety of bacteria which might be classed as ray-form. (2) The ray-fungus passes into the human organism, not through the teeth, but through the mucous membrane of the digestive tract or of the respiratory apparatus. Occasionally its entrance is gained through the skin. (3) The vehicles of this fungus are, for the most part, foreign vegetable matter in a dried condition, chiefly various grains, fragments of grains, and the like, which have become infected with the spores of the fungus, and then find their way into the cavity of the digestive canal or are breathed into the lungs in their ordinary function. It is only exceptionally that these force their way through the skin into the organism. (4) Fungoid growths do not belong primarily to the actinoid processes of the ray-fungus. They belong, probably, to the degenerative forms of the same, and represent, as a rule, the later stages of the disease only, and occasionally the first stages of the disease when the conditions of growth are unusually favorable. Occasionally in actinomycotic gland there are found with the typical thin threads, very thick, thorn-like threads, which must be regarded as a development of

the fungus itself or as a development of the same, and must not be looked upon as a specially foreign form of bacteria, for the reason that they have an alygous construction with the typical actinomycosis, and because they are closely related to these in a later development stage of the fungoid growth, and because the whole course of the sickness concurs with this theory. (5) The contagiousness of actinomycosis between man and man or man and animals, or the reverse, must be regarded as rather unlikely, especially as ray-fungi, which are obtained from man, seem to possess very little virility. (6) As a means of prophylaxis, contact must be avoided with the various dried and dust particles of vegetable matter, for example, fragments of straw, corn and the like, such as are found in the threshing of grain. (7) Actinomycosis in the regions of the face and neck may rarely cure itself. (8) Operative treatment of actinomycosis is limited to free incision and enucleation and antiseptic packing of the superficial, easily approachable masses. The most severe operations should, as a rule, be avoided. In the smaller foci of this disease, injection of tincture of iodine or similar antiseptics might be tried. (9) In actinomycosis of the lungs or of the internal organs, operations are exceedingly difficult, and should be limited to an intravenous injection of argentum colloidal Crede, combined with the use of Crede's ointment rubbed into the skin.

#### OBSTETRICS AND GYNECOLOGY.

**Extra-uterine Pregnancy.**—During the last ten or fifteen years there has been so much discussion upon this subject that in about fifty per cent. of cases of extra-uterine pregnancy the true nature of the trouble is now recognized by the family physicians. H. J. BOLDT (Med. Rec., Jan. 10, 1903) reiterates the typical symptoms of this important and dangerous affliction. The non-appearance of menstruation at the expected time with the signs of pregnancy when a patient has previously been regular, followed in a few days to five weeks or more by the symptoms of partial or complete rupture. Usually only a week or less elapses after the expected menstrual flow before symptoms begin to manifest themselves. Pain in the lower abdomen most marked on the affected side is perhaps the first indication of trouble. It is usually severe and cramp-like in character, lasting an hour or so, and then subsiding for a few days or more. Following the attack of pain there is usually a flow of blood which is thought to be the menstrual flow, but is darker and more tarry than normal. The severity of symptoms depends upon the extent of the process, whether it is a tubal abortion or a partial or complete tubal rupture. In the latter case the pain is very intense, and the patient usually collapses as a result of the pain, and the large intraperitoneal hemorrhage. Bimanual examination will show the uterus somewhat enlarged, and its consistency relaxed. To either side of the organ, and sometimes behind it a mass will generally be felt, unless the rupture has been complete, and the blood is still free in the general peritoneal cavity, and even then there is usually a fulness in the cul-de-sac. The consistency of the blood-mass depends upon its age, the longer it exists, the more firm it will become. The passing of a decidua is not common. The pain may be no greater than sometimes is seen in dysmenorrhea, and as the bleeding may come at or about the same time as the normal menstruation, and even be normal in appearance, the diagnosis is frequently very difficult. In any doubtful case an examination should be insisted upon. In regard to treatment there are but two methods worth consideration, the conservative and the surgical. If a patient is seen who has a tubal abortion in progress, and from

the examination it is evident that the blood is well formed into a clot, determined by its consistency; it may be permissible to watch and wait, provided she is amid surroundings which will permit of immediate surgical interference. She should then be carefully watched, on a fluid diet, with ice coil on abdomen and absolutely at rest, even if morphine is necessitated. In favorable cases the tumor will then become gradually smaller and more firm. Again, if the history and symptoms show that the patient has had a complete tubal abortion, objectively determined by the absence of an enlarged Fallopian tube, such as we would find if the embryo still remained in the tube, and if she has recovered from the shock thereof, a similar course is permissible. A hematocele will then form in the course of a few days to such an extent that it is readily recognized by the examining finger, and its further progress can be carefully watched. It is probably best to operate at once on all cases who have a progressive condition or who have not a well-defined hematocele. Abdominal section is rapidly made, the tube is found and caught by a clamp as soon as possible and the abdominal cavity cleared of the blood and clots. It is not necessary to remove all the fluid blood. Hot saline solution is freely added and the abdominal cavity filled with it before suturing. Infusion is frequently necessary.

**Conservative Surgery on the Adnexa.**—Realizing the many disadvantages that most women labor under after having undergone the recognized mutilating operations upon the genital organs, J. KIRIAC (*Gaz. de Gyn.*, Jan. 15, 1903) proposes a conservative operation that is believed to be entirely original. The operation not only frees the diseased organs from the unhealthy parts, but preserves either the ovary or tube in its totality. The ovary is freed from its adhesions, and brought out of the wound. It is then divided from end to end, as in treating a kidney. The two cut surfaces are then carefully examined. All cysts and diseased portions are removed. This operation is called by the author "scapsie," from the Greek "scapto," to sculpture or to hollow out. If the ovary alone is operated upon, it is "ooforoscapsie;" if the tube is in question, it is called "salpingoscapsie," and when both tube and ovary are operated upon, "salpingo-ooforo-scapsie," or more briefly, parartimato-scapsie. After having removed the diseased parts with a curved bistoury or a pair of scissors, the two fragments are brought together, that is to say, the organ is reconstructed. If there has been much tissue removed, two sets of sutures are necessary to hold the parts together; deep, retention layer, and a superficial layer. If in the case of an enormous destruction of either organ by abscess or cystic formation, the best procedure is to remove the whole organ, as there is nothing remaining to be preserved. This method of operating has given excellent success in six cases.

**Rupture of the Uterus with Recovery.**—This is so relatively rare a termination of a dread complication that it is worthy of record. CLAUDE B. PASLEY (*Brit. Med. Jour.*, Jan. 17, 1903) records a case of a primipara, aged twenty-eight years, suffering from advanced aortic valvular disease. The presentation, as usual, was transverse and the pelvis slightly contracted. The condition was corrected to a vertex presentation, a binder applied and the patient left to continue her labor. Six hours later, it was found that the transverse position had recurred. The vaginal temperature was 103° F., and the waters had come away. The child was delivered by forceps two hours later, the patient's temperature having risen to 104½° F., pulse 140. The placenta was delivered ten minutes later, and the woman was so near death that no chloroform could be

used during any part of the procedure. Strangely enough, without operative intervention, although the case was diagnosed as one of rupture, the patient proceeded to rally, and although there was a large abdominal blood clot, this absorbed, and she made an uninterrupted recovery.

**Uretero-Ureteral Anastomosis.**—The unintentional division of the ureter in operations in the abdominal and pelvic cavities is not of frequent occurrence. Nevertheless, remarks GEORGE BEN JOHNSON (*Am. Gyn.*, Jan. 19, 1903), this accident is apt to occur in cases in which numerous adhesions exist, and the anatomical relation are much disturbed. The ureter may be so displaced from its normal position, and be so completely embedded in a mass of adhesions, as to make its identification practically an impossibility. In the event of such an accident, a decision as to the best procedure to follow is of paramount importance. Several methods of dealing with the condition are at hand: (1) The kidney on the injured side may be removed; (2) the ureter may be passed into the intestine, colon or rectum, into the vagina or through the abdominal wall; (3) the kidney may be brought down, and the extremity of the ureter sutured into the wall of the bladder; (4) an anastomosis may be made between the extremities of the divided ureter. This classification, while not exhaustive, covers the most important procedures so far devised. Of these methods the last two are the most worthy of consideration. Uretero-ureteral anastomosis would seem to be the operation of choice. Uretero-ureteral anastomosis, or uretero-ureterostomy, as the operation is designated by Kelly, may be performed in various ways. Henry Morris gives the following classifications: (a) End to end anastomosis by suturing the ends together in a transverse line; (b) end to end anastomosis; (c) lateral implantation; (d) end to end anastomosis by suturing the ends together in an oblique line. The transverse end to end method was used by Schopf (1886) in the first recorded cases of uretero-ureteral anastomosis. The objections to the operation were so serious that the operation has been almost discarded to-day. Poggi originated the end to end anastomosis. Lateral implantation was devised and described by Van Hook in 1893. Kelly was the first to apply this method to the human subject. The oblique end to end anastomosis was first used by Bovée. The author reports two successful cases in which the Van Hook method was employed.

**Ventrofixation.**—The following adverse criticism of the various forms of this operation are given by R. GRADENWITZ (*Z'blatt f. Gyn.*, Jan. 31, 1903): (1) The procedure of employing stumps of ligatures after the adnexa have been removed is not advisable. If retroversion or retroflexion has been present, ventrofixation is unnecessary, if the stumps may be sewn together or partially sewn together; (2) ventrofixation carried out on stumps of ligaments, that is, without an operation upon them, is to be condemned for the reason that they lead to the making of a pocket. Better results are obtained by the Alexander-Adams operation; (3) the method of bringing the front surface of the fundus up to the abdominal wall promises the best cure for retroversion, but should be condemned because of its danger of metritis, hernia through the abdominal wall, and disturbance of pregnancy and childbirth; (4) if one ligament has been removed, this operation leads to the danger of ileus. The Alexander-Adams operation is a good substitute, especially for posterior colpotomy; (5) after the climacteric, vaginal fixation is perhaps the best operation for these cases.

**Management of Difficult Breech Presentations.**—Difficult but not impossible breech presentations are

most often seen in primipara, where the child is disproportionately large, because the mother's pelvis is slightly contracted; it may occur in any case in which the cervix, vagina and perineum are unyielding, and in multiparae, when the child is extraordinarily large. It includes original breech presentations, and those which were vertex and have changed to breech by version. The following method of delivery, H. J. STACEY (Am. Jour. Obstet., Feb., 1903), believes to be original. Allow labor to progress naturally, until the breech is down nearly to the perineum; if the cervix is not disposed to dilate sufficiently to permit this, dilate with the fingers. Dilating instruments are not of use in this operation. Now gently push the child upward and bring down both feet. With the child's thighs in the cervix, reintroduce the hand—the palm of which, in the semiprone position, corresponds to the child's abdomen—and dilate the cervix and lower uterine segment thoroughly, until they are practically paralyzed. See that the cord is out of the way. Grasp the feet and draw the child slowly downward until the umbilicus is nearly at the mother's vulva, while an assistant, or the operator's hand, if necessary, keeps the head flexed so as to avoid extension, and consequent catching at the brim. The arms and shoulders are then quickly delivered, delivering the posterior arm first, and then rotating and delivering the opposite arm. The assistant then takes the child, while the operator quickly but carefully delivers the head with forceps. The advantages of this method of delivering breech presentations are (1) the time of labor is shortened; (2) there is little or no laceration of the mother; (3) the child is neither strangled or mutilated.

**Sarcoma of the Uterine Parenchyma.**—Sarcoma arising in and developing from the myometrium as a multinodular new growth of the uterus is a very rare and, from a clinical and pathological standpoint, one of the most interesting diseases of the female genital tract. HENRY D. BEYEA (Am. Jour. of Obstet., Feb., 1903) was unable to find more than seventy or eighty such cases in the literature. It would seem that no accurate clinical study of this class of uterine sarcomata had been made. Their histogenesis is undetermined and is a question which has led to much discussion. Some investigators believe that they arise through a metaplasia of the muscle cells of a preexisting myoma of the uterus and are myosarcoma; others, that they arise in the connective tissue cell of such a tumor; still others, that they are primary sarcomata of the myometrium. It would seem probable that the first theory was the correct one; possibly some arise from the connective tissue and others from the myometrium. The author reports a case in which the histogenesis was most doubtful and impossible to determine.

**Frequency and Etiology of Extra-uterine Pregnancy.**—The various statistical studies of this subject show widely differing points of view as regards cause and frequency. An additional series of cases is presented by W. HAHN (Münch. med. Woch., Feb. 10, 1903) who has collected all the cases in the Vienna hospitals and analyzed them. From 1892 to 1899, 241 laparotomies and 45 vaginal sections were done for extra-uterine pregnancies, with 21 deaths in the former and seven in the latter. These numbers are probably far below the actual figure, as private records were inaccessible. The author also found that the most common cause was gonorrhea, which accounts for the greater number of cases in the large cities. The increase in this condition, which has been noticed during the past few years, must be attributed to the greater prevalence of gonorrhea and also to the fact that a more precise knowledge of the history and symptoms

has aided the diagnosis and has demonstrated that the disease is more frequent than heretofore considered. The final results of treatment, both operative and conservative, are quite good, the danger has been lessened and the prognosis in most cases can be considered favorable. The best prophylactic measure, it seems, is to guard against gonorrheal infection.

**Toxemia of Pregnancy.**—The eclamptic seizures are at the present day considered to be due to a general toxic condition of the blood rather than to a disease of the kidneys. W. H. WELLS (Phil. Med. Jour., Feb. 21, 1903) has also observed the effects on pregnant women of gastric and intestinal catarrhs following influenza, and considers that they are often the predisposing cause of what appears to be a very resistant form of toxemia. Plethoric rather than anemic women are affected, and the main symptoms are headache, ocular pain and soreness, photophobia, frequent micturition, urine less normal, a slight pyrosis, nausea and edema. One set of cases are marked by lesions pointing to the kidney disease. The second set presents symptoms of chronic gastro-intestinal catarrh, but with a urine characteristic of toxemia. Urea excretion should always be the principal guide in diagnosis and the latter should never be made from the presence or absence of albumin alone. The symptoms may resemble those of hysteria, and attention is called to the fact that hysteria may be caused by toxemia. Other conditions which must be eliminated are threatened miscarriage and acute indigestion. The author's recommendations for treatment are to increase elimination by bowels, kidneys, liver, and skin. He advises calomel, but in fair-sized doses, 5-10 grs., and combines it with sodium phosphate, 1 dram in four to five powders q. i. h. High rectal irrigations are of greatest value on the verge of eclampsia.

**Fibroids of the Uterus.**—Impaction of a fibroid in the pelvic cavity is not a very uncommon complication, and is always fraught with considerable difficulty for the practitioner and danger for the patient. A. H. G. DORAN (Lancet, Feb. 21, 1903) says that pushing up the impacted fibroid is never a safe procedure, and is especially dangerous during pregnancy. Pregnancy may be overlooked in a young woman where menorrhagia is present and simulates menstruation. The fibroid is usually firmer than the gravid part of the uterus, and not rarely very much harder; the danger of pushing a hard mass against a soft mass is evident. A hard mass in the pelvis, associated with a pregnant uterus is usually supposed to be a fibroid, and when impaction is threatened many practitioners try to push the mass out of the pelvis. Experience teaches, however, that a small, thick-walled, dense ovarian cyst, pressed down into the pelvis may feel very hard when the hand contrasts it with the soft, pregnant uterus. The fact must be remembered, as rupture of an ovarian cyst in pregnancy is serious. Finally, about the whole matter of pushing up pelvic tumors in pregnancy, he insists upon the difficulty of diagnosis in these cases, where the tumor can seldom be exposed by manipulation. A swelling resembling a cystic fibroid might prove to be a hydatid cyst. Even when pregnancy is not present, a fibroid should not, in every case, be pushed out of the pelvis, because the fact of impaction is only certain when the operator knows on very reliable evidence that the mass thus fixed in the pelvis was recently free and movable. Tearing a broad ligament fibroid might entail serious consequences.

**Ectopic Gestation.**—The following conclusions on this subject are offered by KRÖMER (Arch. f. Gyn., V. 66, H. 1). The imbedding of the ovum in the tube is completed in accordance with physiological principles exactly as in the uterus, in the fact that the tissues

of the mother take up and completely surround it. The difference between the later development of the ovum in the tube and those which occur in uterine implantation are probably explained by the structure of the tube wall, which is not adapted to the purpose of nourishing the fruit. The possibility of transference of the implantation of the ovum from the tube is at the present unknown. This is a fact which is probably explained by the deep intramuscular embedding of the ovum and the occurrence of pregnancy in a tube otherwise normal.

### NEUROLOGY AND PSYCHIATRY.

**Transverse Myelitis in a Newborn Infant.**—A most interesting and unusual case of spinal cord lesion in an infant is reported by A. H. DAVISSON and D. J. MCCARTHY (Phil. Med. Jour., Feb. 21, 1903). When first seen by the authors the child was two months old. The family history was negative. This, the fourth pregnancy, was a breech case and no details of the labor are given except that primary respirations were long delayed. The failure to move the lower limbs was noticed when four weeks old. At eight weeks the child seemed fairly well nourished, but presented a flaccid condition of the abdomen and lower limbs with absolutely no voluntary movements. There were no respiratory movements of thorax or abdomen, but at regular intervals there was a sinking in of the sides of the chest wall. Reflexes and sensation were absent up to the level of the xiphoid cartilage, above this the conditions were normal. No atrophy of the lower limbs was present, and the feet were warm. The diagnosis lay between a transverse lesion at the second or third dorsal segments and a stretching of the spinal roots. The latter, however, could be almost excluded by the anesthesia up to the cervical segments. The age at time of death is not mentioned, but the autopsy showed the cord collapsed from the second to the eleventh dorsal segments. The cervical and lumbar portions seemed normal. The pia of the collapsed area was thickened and the vessels tortuous. Microscopical examination was unsatisfactory, but the authors think the cord filled the pial tube, but as the result of a hemorrhagic process, softening of the cord and resorption of the degenerated cord substance took place. This may have been the result of injury at birth or it may have developed in the last months of pregnancy.

**Reflex Convulsions in Growing Boys and Girls.**—Convulsive attacks occur in rickety and highly neurotic infants during teething and other reflex irritations. It is not so well known, according to E. SMITH (Lancet, Jan. 24, 1903), that they also occur in pure reflexes during worry in children about 11 or 12 years old, members of families of distinct neurotic tendencies. There is one symptom in common deserving attention, namely, habitually cold feet in these individuals. It usually provokes little attention, but, if disregarded, may thwart the best efforts of the physician in treatment. With these cold feet, the child's sensibility to chills is increased. He can offer no effectual resistance to the sudden changes of temperature. Digestive derangement follows, malnutrition, and weakness and injurious tendencies are irritated. The nervous system is then readily thrown off its balance. If such nervous conditions may be controlled in the infant, they certainly may be in the older child. Such nervous seizures are as harmless in the older child as in the younger child, and apparently leave the patient in no worse condition, but there are cases where the condition becomes so chronic and recurrent that hardly any appreciable excitable cause may exist to bring them about. It is therefore advisable that the children should have their health built up, and such sickness and general depres-

sion as coldness of the feet should always have attention.

### Pathogenesis of Delirium in Infectious Diseases.

—Stimulated by the success of Betti in the treatment of delirium through application of leeches to the mastoid process, A. AMANTINI (Gazz. Osped., Feb. 8, 1903) has made use of the same measure in six cases; with the result that in all, delirium ceased within a few minutes to an hour after application. Judging from this experience, the author believes with Betti that delirium is largely induced by circulatory disturbances; and that the withdrawal of blood through the mastoid vein, and through that from the endocranial circulation, has a salutary effect upon cerebral congestion. To the objection that the circulatory disturbances of cardiac cases do not give rise to delirium, he makes reply that there is a distinction between cerebral congestion in general, and that occurring when the blood is charged with specific toxins; yet the small amount of toxine withdrawn from the system by leeching, in such conditions, would not alone account for its favorable effect. Moreover, many patients who give evidence of intense infection do not become delirious. The coincidence of delirium with hyperpyrexia, Amantini believes, is not due solely to the high temperature, but rather to congestion; as shown in the patient's face and at autopsy; viscosity of the cerebral tissue accompanied by arterial and venous hyperemia being seen. A further argument in favor of the congestive origin of delirium is found in a case reported by the author, in which delirium ceased upon the occurrence of epistaxis. Predisposition to delirium through alcoholism or hereditary neuropathy was definitely excluded in all the author's cases.

### On the Permanent Care of the Feeble-minded.

In dealing with various plans for the care of feeble-minded persons who naturally fall within the numerous well-defined classes of this condition, E. F. PINCENT (Lancet, Feb. 21, 1903) mentions the following as the last kind of work recently undertaken by the Birmingham After-care Committee. It had been known for some time that there were a large number of idiots, imbeciles, epileptics and feeble-minded persons who had not passed through the regular classes of the institutions, and were not on the ordinary after-care lists of the committee. With the help of the School Board officials and others, a list of these cases was collected. After a sufficient number had been found, it seemed advisable to appoint a committee, consisting almost entirely of medical men, who undertook to examine and report on these cases. In this way the committee hopes to inform the city council of Birmingham the precise extent to which the evils exist. At any rate, it is intended to classify these cases under various heads, which should of themselves make it possible to do something for these dangerous and unfortunate members of society. The classes under which it is proposed to bring these cases are the following, consisting chiefly of two main divisions, namely, patients of the school age and those over the school age. Class A, those of the school age, i.e., those under sixteen years of age, are divided into (1) those suitable for special classes for the feeble-minded. These, of course, have already been dealt with by the School Board appropriately, although the medical committee is finding some few cases which hitherto had escaped notice. (2) Cases which, for various reasons, could be better dealt with in boarding schools for the feeble-minded. Such cases have already been recognized, by the London School Board, for example, and classified under the following heads: (a) Mentally defective children who, but for their defect would be committed to industrial

or truant schools; (b) mentally defective children living in very bad homes; (c) mentally defective children whose regular attendance it is not possible to secure at any school; (d) mentally defective children so far from any day school that it would be impossible for them to attend; (e) defective children known as "morally defective." (3) Epileptics. (4) Epileptics who are also feeble-minded. (5) Feeble-minded children who are also crippled, blind or deaf mutes. (6) Imbeciles and idiots. The class which includes those over the school age embraces the following subdivisions: (a) Mentally deficient, but capable of industrial work under supervision, i.e., cases suitable for a permanent industrial colony; (b) mentally deficient, incapable of work, i.e., suitable for a permanent colony; (c) epileptics who are capable of work in a colony; (d) feeble-minded epileptics; (e) feeble-minded persons who are also crippled, blind or deaf-mutes, and (f) imbeciles and idiots.

### PHYSIOLOGY.

**Rôle of the Duodenal Mucosa in Digestion.**—Recent studies have shown that the duodenal mucosa plays an important part in digestive processes, says L. HALLION, (*Jour. de Méd. de Paris*, Feb. 1, 1903), through its elaboration of secretine and enterokinase; the function of the former being to excite the secretion of the pancreatic juice, and of the latter to intensify its digestive power. The author quotes the experiments of Bayliss and Starling, which showed that when shreds of the duodeno-jejunal mucosa were treated with hydrochloric acid, a substance was obtained which, when injected into the blood, provoked an abundant secretion of pancreatic juice. To this substance the name of secretine was given. It is believed that the gastric juice with its hydrochloric contents fills a like rôle. Passing to the intestine, it there gives rise to chemical reaction resulting in the production of secretine. So also, the author states, will the administration of hydrochloric acid or képhir (a substance similar to kumyss and rich in lactic acid) in cases of deficient gastric secretion, excite production of secretine in the intestine and this in turn passing through the blood to the pancreas, stimulates the flow of the pancreatic juice; thus enabling the intestine to supplement, if not replace, the crippled gastric function. The author emphasizes the necessity in gastro-intestinal anastomoses for pyloric affections of making the anastomosis as high as possible, that the gastric juice may come in contact with an extended surface of the duodeno-jejunal mucosa; where alone secretine is elaborated. With a dry extract of the duodenal mucosa to which the name of enkinase is given, Hallion has demonstrated, in vitro, that neither that substance nor the pancreatic juice alone accomplish albuminous digestion; but when combined, such digestion is complete. In collaboration with Carrière, Hallion has made therapeutical application of these findings, in the preparation of an extract of the duodenal mucosa described as enkinase, which permits the utilization of the secreted pancreatic juice, and also in a combination of three parts of pancreatine with one part of enkinase under the name of kinopancreatine, the digestive power of which is said to be very great. These substances are given in specially prepared gluten capsules, so that they may not be affected by the gastric juice.

**Urobilin.**—An interesting paper read before the Anato-Clinical Society of Lille has for its author M. D'HALLVIN (*Nord. Méd.*, Feb. 1, 1903). He states that urobilinuria may be encountered under varied conditions as in febrile diseases, exaggerated destruction of red cells, hepatic affections, etc. It is well known that

the hemoglobin derived from the destruction of the red cells, is transformed by the liver into bilirubin; and as such finds its way into the intestine through the bile. Under the influence of the intestinal ferments, the bilirubin is changed to urobilin. As to its ultimate fate, considerable diversity of opinion obtains; some holding that it is entirely eliminated in the feces; according to others it undergoes partial resorption by the liver, but never passes into the general circulation. D'Hallvin, however, holds that urobilinemia does occur either when resorption by the liver fails to take place or when that organ elaborates urobilin instead of bilirubin. According to the author a transitory urobilinemia occurs in infectious diseases; but it is permanent in the cirrhoses, in which the hepatic cells are more or less changed. When urobilinemia is present, the kidneys carry off the urobilin from the blood, and urobilinuria results. Aside from this secondary urobilinuria, it may occur when there is no trace of urobilin in the blood, but when bile is present in that fluid. In this condition of cholemia, the kidney has the power, by reduction and hydration, to change the bilirubin of the blood to urobilin. As to the prognosis, urobilinuria secondary to urobilinemia indicates disturbance of the resorptive and secretory functions of the liver. Urobilinuria secondary to cholemia, also points to hepatic trouble, but not of so serious an order. Moreover, absence of urobilinuria in the presence of urobilinemia indicates disturbance of the filtrating power of the kidney; and when cholemia exists, the non-appearance of urobilin in the urine suggests insufficiency of the kidney's reducing and hydrating function.

**Cigar-smoke and Hydrocyanic Acid.**—The discovery of prussic acid in various species of plants has awakened considerable interest in the inquiry, whether this highly toxic substance is present in tobacco-smoke or not. J. HABERMANN (*Hoppe-Seyler's Zeitsch. f. Physiol. Chemie*, Vol. 37, No. 1), finding only contradictory results in the literature concerning this theme, pursued a new investigation with the following results: In all cases the findings were negative as regards the fumes of cigars, not even the faintest trace of hydrocyanic acid could be detected.

### PEDIATRICS.

**Arthritis Deformans in Children.**—While the number of reported cases of this disease is not great, writes I. A. ABR (*Wisc. Med. Jour.*, Jan., 1903), yet two distinct types have been distinguished. One type does not differ essentially from the disease in adults, but the other is different in its morbid anatomy and clinical symptoms. This latter variety shows a chronic, progressive enlargement of the joints with enlargement of lymph-nodes and spleen. The joint lesion consists of a thickening around the joints, rather than of changes in the bone or cartilage, and does not usually show the bony irregularity, or grating or effusion of the other variety. The onset is usually insidious, though occasionally there are rigors and high fever. Bad feeding and privations seem important causative factors, and the disease usually begins before the second dentition. A constant symptom is the lymphatic enlargement and the palpable spleen. Endocarditis has never been reported, though there have been cases with a low grade of pleurisy and pericarditis. In time the process seems to remain stationary, but the patient is helpless, owing to the joint involvement. The variety resembling that of adults usually begins after the second dentition, but Heberden's nodes are rare. Most of the cases follow exposure to cold and wet. Pain is a marked symptom, whereas it is almost absent from the other variety. The synovial membranes and the joint cartilages dis-

appear, the bones becoming of ivory hardness and developing osteophytic growths at their margins. Atrophy of the muscles follows close upon the joint involvement. The two most important theories of causation are that it is a nervous disease, also an infectious disease. The enlarged spleen, involvement of the glands, and a daily temperature in the first described variety would favor the infectious theory, while the symmetry of the lesions, the atrophy of the muscles, and the glossy skin seem to point to a nervous origin. The treatment consists in the use of iodide, proper hygiene and a warm climate.

**Tuberculous Peritonitis.**—From a study of 41 cases at the Paddington Green Children's Hospital, G. A. SUTHERLAND (Arch. of Ped., Feb., 1903) reports that 27 were treated medically with 22 recoveries (81 per cent.), and 14 surgically with 7 recoveries (50 per cent.). Of the 29 that recovered 10 were under observation for less than a year, and 19 for from one to six years. The author's conclusions are that in uncomplicated tuberculous peritonitis the prognosis is good, is still favorable in the presence of tuberculous pleurisy and is less favorable if the patient shows a strong family history of tuberculosis, an infancy passed under bad hygienic or dietetic conditions, a feeble constitution, or a severe infective illness in early life. The symptoms which affect the prognosis unfavorably are continuous pyrexia, persistent diarrhea, rapid pulse, rapid wasting or recurrent acute exacerbations. The complications of unfavorable import are intestinal tuberculosis, extensive caseation of the mesenteric lymph-nodes or of tuberculous masses, localized suppuration from infection through lymph-nodes or the intestine, and obstructive symptoms from bands or matting of the intestine. A bad prognosis results from the rupture of a suppurating lymph-node, or the perforation of an intestinal ulcer into the peritoneal cavity, pulmonary tuberculosis, tuberculous meningitis or general miliary tuberculosis. The prognosis is not appreciably affected by simple laparotomy.

**Eczema in Nursing Infants.**—Aside from lack of cleanliness and the application of irritants to the skin, authorities recognize four great causes for this condition, viz.: parasites, dentition, neuro-arthritis heredity, and disturbances of digestion. F. QUILLIER (Le Prog. Méd., Feb. 28, 1903) believes that dentition may play an indirect rôle in causation by inducing improper nursing. It is noteworthy also, that the parts of the face supplied by the trigeminal nerve, which also supplies the dental region are most susceptible to eczema, especially at the time of dentition. Heredity cannot be more than a predisposing factor. But, of all causes, the most common is improper or excessive feeding. It is the breast-fed infant and not the artificially fed that usually develop eczema, for, in the artificially fed, the mother's attention is directed to the care of her child, the quantity and quality of the food is definite and constant, the feeding more regular and cleanliness more likely to be observed. On the other hand the mother's milk is quickly affected by abuse of coffee, beer, etc., the return of menstruation, mental emotions, diet, etc. Not infrequently the milk becomes altogether too rich for the baby's simple digestive organs, as a result of indulgence by the mother in rich foods, especially meat. Often, also, a breast-fed infant is a regular glutton, taking 100 to 150 gms. of milk in three or four minutes. For treatment, first remove all scales and desiccated exudate by wet applications of potato-starch poultices, then apply an ointment as

B Vaseline	
Lanolin, aa.....	gm. 15
Zinc oxid. ....	4
Precip. sulphur .....	1

Or a powder of talc or bismuth subnitrate. Internally keep the alimentary tract sweet by calomel, sodium bicarbonate of benzonaphthol used in great moderation. At the same time regulate carefully the mother's habits and the times or nursing, if necessary, putting the child for a short time on mixed or wholly artificial feeding.

## HYGIENE.

**Transmission of Yellow Fever.**—Although the exact specific cause of yellow fever has not yet been found, authorities are generally agreed that it is a parasite similar in its life cycle to the malarial plasmodium. That it can be introduced into the human being by the bite of a mosquito has been proven beyond a doubt and that this is the only method of communication seems most plausible both from its analogy to other diseases and as a result of the most careful scientific experiments. J. W. ROSS (Med. Rec., Jan. 24, 1903) describes the experiments which were conducted in Havana to infect human beings by means of fomites and also the wonderful results which followed the attempts to prevent the mosquito from biting yellow fever patients and then subsequently biting well persons. The marked improvements in the sanitary conditions of Havana which followed the American control during 1899 and 1900 had an immediate beneficial effect in the spread of all infectious diseases except yellow fever. Early in 1901 special attention was paid to the extermination of the mosquito and the thorough isolation of all yellow-fever patients from the mosquito. As a result there was at once a gradual decrease in the number of these cases and since September, 1901, not one case has arisen in Havana. As no attention was paid to any other means of communication of the disease it seems just and reasonable to conclude that the mosquito is the only intermediate host between man and man for the specific cause of yellow fever.

## GENITO-URINARY AND SKIN DISEASES.

**Open-air Treatment of Syphilis.**—The importance of a general constitutional treatment in cases of syphilis does not seem to be fully appreciated and insisted upon. E. H. DOUTY (Med. Rec., Jan. 31, 1903) believes that the ravages from this disease depend more upon the soil upon which the poison falls than upon the virulence of the poison itself. In a large practice in a university town he had been greatly impressed with the fact that whereas a poor, underfed scholar, if infected, was hit painfully hard, the well-to-do athletic undergraduate generally suffered lightly, in spite of the fact that the latter was often very casual about taking his mercury. On account of this complete reliance which is placed upon mercury and potassium iodide, the general health is frequently much neglected and the disease is never entirely eradicated even if greatly improved. That such constitutions are in a favorable condition to acquire tuberculosis is proven by the fact that from 30 to 50 per cent. of the phthisis patients seeking relief in the mountains of Switzerland are syphilitics. If the importance of careful attention to the general health and, if possible, a life in the open-air, which is recommended for the early cases of tuberculosis, could be urged upon the unfortunate victims of syphilis, the distressing tertiary lesions might be greatly reduced.

**Radiotherapy in Cancer.**—Of 47 cancers treated with X-rays by C. W. ALLEN (Jour. of Cut. Dis., Feb., 1903), 10 were mammary, 1 each, rectal, uterine and of the lymphatics of the neck; 3 sarcoma, and 1 supposed to be sarcoma, leaving 30, more or less, skin cancers alone, of which 2 involved the skin, 9 the nose or the nose and the cheek, 3 were multiple, 5 were upon the cheek near the eye, 4 were on the lip, and 2 on the arm. The results were: deaths, 5; cures and

discharged, 25; improved and ceased treatment, 3; unimproved, 5; improved and still under treatment, 9. The conclusions which this author offers and bases upon this record are as follows: The X-ray possesses decided therapeutic power; but occasionally produces injury. His results show that it is not a passing fad, likely to be dropped after a brief experiment. The effect of the method sometimes produces severe symptoms in the heart, lungs and other viscera, pointing to absorption of disintegration products, which are thrown into the circulation more rapidly than they are eliminated. Metastases occur in grave forms at times more rapidly than in patients not so treated. Cancer itself may be produced by the injurious effect of the rays in a person not known to be predisposed. An example is furnished by a case which he reports of an X-ray tube-maker whose arm was amputated for cancer developing in an X-ray scar. X-ray dermatitis and many of the good effects as yet depend upon the proximity of the tube, the completeness of the vacuum and the degree of heat of the anode tubes may at times reach a "burning state" which must be learned by experience and observation. There is nothing to indicate when this condition is present, aside from the effect produced. This method of treating cancer is not to be relied upon solely in all forms of cancer. In the nodular, warty and dry growths, other means of removal, preferably by arsenic paste, should be employed, and then the rays may be applied. Indiscriminate application of X-rays to all forms of disease, as claimed to be practised by advertising institutions and by charlatans, and the deceit practised by calling other rays by this name are apt to bring much undeserved reproach upon a method which is really useful and whose effect is at times almost magical, but quite frequently disappointing.

#### EYE, EAR, NOSE, AND THROAT.

**Chronic Sphenoiditis and Middle-ear Disease.**—This subject is introduced by EMERSON (Laryngoscope, Jan., 1903), who examined 268 cases of chronic catarrh of the middle ear. Caries of the sphenoid was found 25 times. These 25 and 10 seen later gave 32 unilateral, and 3 bilateral cases. Twenty-one cases were of chronic catarrhal otitis, 4 chronic suppurative, 7 chronic catarrhal on one side and chronic suppurative on the other. Headaches were the rule; 9 had vertigo. The head-pain was often only one-sided, where the sinus trouble was on the same side. Tinnitus often disappeared when the middle turbinate of the side affected was removed and the sinus cured. "There is a relation between the pus formation incident to sinusitis and atrophic changes in the nasopharynx."

**Electrolysis in the Eustachian Tube.**—In the Jan. 1903, number of the Laryngoscope two articles of value on this subject are given. The first by NORVAL H. PIERCE gives the result of a study of this treatment in 20 cases after other treatment had been tried. Ten were cases of "oto-sclerosis, or rarefaction of the labyrinthine capsule." Eight were catarrhal, one nervomuscular, one syphilitic. The oto-sclerosis cases were all treated once a week for two months together with catheterization every other day. Audition was not improved in any one of them; nor were the entotic sounds diminished. Tuning fork tests for upper and lower limit were unchanged. In none of the eight catarrhal cases was there any improvement beyond that by other methods. "In a certain few cases where there is probably a soft exudate near the isthmus, this treatment may be of some value." In the second article by J. O. TANSLEY a minute account is given of the finding of a broken end of an electrolytic bougie in the pharyngeal opening of the tube, whose removal permitted of beneficial treatment by the ordinary methods. The

analysis of 33 cases given by Harris, is referred to as showing its results, which are disappointing and the treatment not without danger and certainly not better than other methods.

**Follicular Conjunctivitis and Trachoma.**—The larger number of cases of trachoma, which have been reported among school children of this city, has led to the suspicion that a mistake in diagnosis has been frequently made. Considering how difficult it is even for an expert to differentiate between follicular conjunctivitis and trachoma it is perhaps not to be wondered at that the superficial examinations made by inexperienced men should result in numerous errors. E. M. ALGER (Med. Rec., Jan. 24, 1903) points out that trachoma is a comparatively rare condition in children while follicular conjunctivitis is very common. They are both characterized by granulations which cannot be differentiated either macroscopically or microscopically. These granulations are simply collections of adenoid tissue. In trachoma the essential feature is the hypertrophy of the conjunctiva. Without this there can be no future development of scar tissue and the disease is a trivial one. The subjective symptoms of trachoma are noticeable. The patient complains of gluing of his lids, photophobia, sand in his eyes, the upper lid is partly dropped and there is more or less purulent discharge. In a portion of the cases injury to the cornea follows, either ulceration or pannus. When the thickening of the conjunctiva has reached a certain height a process of cicatrization begins and continues till the hypertrophic tissue has been replaced by a thin white scar and it is from the contraction of these scars that the most troublesome sequelæ come. Follicular conjunctivitis is simply the reaction through the lymphatics of the conjunctiva to local irritation which may be chemical, mechanical or bacterial. On the lids there are small wound granules, not larger than pin heads because they are limited by the close adhesion of the membrane to the lid, but in the loose tissue of the fornix they are much larger, resembling frog spawn. The symptoms are usually very slight and the trouble will disappear if the cause of the irritation is removed. Since a fair percentage of the children who were recently condemned to trachoma, received their first intimation of any eye trouble when they were told by the examining physician it is reasonable to believe that the natural mistake of confusing the two conditions, was frequently made. In treatment there has been an equal confusion. In trachoma it is considered an ideal result to get finally a thin white scar not capable of contracting unduly or of causing irritation to the corneal surface, and many have been led in the pursuit of this ideal to treat with bluestone and silver nitrate follicular conjunctivitis which would not develop scars even if left entirely without treatment. The latter cases are generally benefited by cod-liver oil and iodide of iron. Locally, good results may be obtained by applying with a swab, at least three times a week, a solution consisting of:

R Ichthyol .....	℥ xv
Tr. Iodi .....	5 j
Glycerini .....	5 j
As the conjunctiva improves the solution is rubbed in more vigorously. On the alternate days an instillation of the following is made at home:	
R Zinci Sulph. ....	gr. j
Vin opii .....	℥ viij
Aque .....	5 ss

M. et Sig.: One drop in each eye t. i. d.

Expression is perhaps helpful if the child can be closely watched but it is unnecessary and a majority of the cases must be treated without it. The treatment of real trachoma demands a more thorough and care-

ful management under the close observation of a competent medical man, to avoid the serious results of scarring.

**Ozena in Nuralings.**—One-tenth of the cases of ozena treated by A. RIVIÈRE (Jour. de Méd. de Paris, Feb. 15, 1903) occurred in infants under one year; therefore he holds that the affection is of more frequent occurrence in early life than is generally supposed; and that in many cases diagnosed as chronic coryza and infectious purulent or impetigenous rhinitis, careful examination would show the characteristic atrophy of the turbinates and nasal mucosa, wide nasal fossæ, crusts and malodor of ozena. Under appropriate treatment he has not only seen the local trouble subside but complicating gastro-intestinal disturbances disappear; marked improvement in the general health ensuing. Rivière treats such cases by daily irrigation of the nasal cavities with halt or boric acid solution; using in preference a soft urethral catheter connected with the delivery-tube of a vessel suspended not more than 0.15 to 0.20 above the child's head.

### THERAPEUTIC HINTS.

**Large Doses of Salicylates in Uveitis.**—By mistake a patient of H. McI. Morton had taken four or five 60-grain doses of salicylate of soda every three hours with marked improvement next day of the uveitis. In subsequent use of large doses he had noticed similar response in this disease. He cites Marageliano in support of the view that it is not a depressant of the heart, for the arterial pressure is elevated in moderate dosage. In severe cases MORRIS (Oph. Record, Jan., 1903) gives 40 grains of the salicylate every two or three hours till relief is obtained.

**Calomel in Pneumonia.**—The beneficent influence of calomel in pneumonia is emphasized by C. BERTALOTZI (Gazz. Osped., Jan. 18, 1903) who, in one case, not only gave the drug with excellent results in the onset of the disease, but apparently brought about a sudden and remarkable improvement when the disease was at its worst and the patient profoundly exhausted from its effects, through repetition of the initial treatment, i.e., calomel 0.65, scammony 0.25. Prior to its administration the temperature was 39.5 C., pulse 110, respiration 43. The day following, the temperature dropped to 36.6 C., pulse 70 and respiration 38. This seemed to mark the turning point in the disease; abundant perspiration ensuing after the one large stool produced by the remedy, and evidences of the breaking up of consolidation soon being apparent on percussion and auscultation. The author concludes that the influence of calomel in pneumonia is to be attributed to the cutaneous vasoparalysis and subsequent perspiration it induces in common with antipyretics in general, and to its intestinal derivative effect by means of which a good part of the blood is drawn from the lung and the toxic principles with which the organism is embarrassed, carried off in the abundant stools.

**Pilocarpine in Scarlet Fever.**—The physiological effects of this drug are exerted chiefly upon the secretions in the following order of potency: salivary, muciparous, mammary, sudoriferous, lacrymal and renal. Vomiting is frequent, the pulse slower and softer, the respiration superficial and retarded. Amblyopia occasionally supervenes, and the growth of hair may be stimulated. Increased leucocytosis is invariable. There are many contraindications to the use of the drug, as in cardiac or respiratory difficulties, asthenia, the very young, the aged, and where the system cannot stand depression. E. W. SAUNDERS (Arch. of Ped., Feb., 1903), finding that, according to the researches of the Pasteur Institute, the saliva possesses the greatest toxic power of all the secretions and is poured out

in the locality where the scarlatina toxins are formed, regards pilocarpine as the most valuable single agent against scarlatina and its associated affections. It should not be given in immediate conjunction with the coal-tar antipyretics, and each dose is better preceded by bathing. Chloral is nearly always indicated in small, frequently repeated, doses. In case of disagreeable effects from pilocarpine, a hypodermic of atropine, the "physiological antidote" will protect the patient. Tolerantation is rapidly established. A great gain is in the prevention of parched mouth and lips.

**Gelatinized Serum in Typhoid Hemorrhage.**—On the eighteenth day, in a case reported by VIDAL (Le Progrès Méd., Feb. 14, 1903), the patient having sustained a large hemorrhage, was given an injection of 250 gm. of saline. The bleeding continued, however, in spite of two subsequent saline infusions. So 20 c.c. of gelatinized serum were injected hypodermically and 250 gm. given by rectum. The next morning the patient was better, having been through the night stimulated with caffeine, strychnine and camphorated oil. Apparently the bleeding had ceased. Ten c.c. more of gelatin serum were administered and saline every twelve hours, and there was no further hemorrhage. To make gelatin serum it is necessary to take a very pure gelatin, that prepared for bacteriological purposes, dissolve it in an isotonic liquid, such as normal saline, filter it hot into flasks, and subject these to a temperature of 115° C. for fifteen minutes. If it is heated longer the serum may solidify very hard on cooling. This is a fine culture medium for bacteria, therefore should be fresh made and much care taken in its preparation. The serum slowly solidifies, so before use it must be brought to a perfect liquid at 50° C. (122° F.). Should it be kept, contamination is at once evident by the appearance on its surface of bacterial cultures.

#### Falling of the Hair.—

R Pilocarpinæ nitrat.....	0.50	(gr. viij)
Tinct. cantharidis.....	10.	(3iiss)
Glycerini .....	25.	(3vj)
Aq. Cologniensis.....	ad. 240.	(3viij)

—Bulletin Gén. de Thérapeutique, Jan. 30, 1903.

**Headache from Eye-strain.**—Of local applications, the simplest, most effective and least harmful, according to C. A. WOOD and T. A. WOODRUFF (Med. Stand., March, 1903), are very hot or very cold fomentations. Fold a towel to twelve inches by four, dip into water at 40° C. or at 160° to 180° F., and press gently against eyes, forehead and temples. Repeat every fifteen seconds for five minutes. A soothing collyrium may relieve by its action on the congested conjunctiva, as:

#### R Sod. borat.

Ac. boricæ.....	aa. gm. 2.	(3ij)
Aq. camphoræ.....	15.	(3ss)
Suprarenal .....	0.7	(3ss)
Aquæ q. s. ad.....	60.	(gr. x)

Shake well, allow to stand an hour or two, and use the supernatant liquid to drop into the eye. Another effective eyewater is:

R Chloreton.....	0.1	(gr. jss)
Sod. borat.....	0.5	(gr. viij)
Aquæ .....	30.	(3j)

A local application to forehead and temples is:

R Spt. Camphoræ.....	30.	(3j)
Spt. Lavand.....	90.	(3iij)
Alcohol .....	90.	(3iij)

Or the following liniment:

R Chloroformi .....	30.	(3j)
Camphoræ .....	8.	(3ij)
Tinct. aconiti.....	8.	(3ij)
Ol. menth. pip.....	0.7	(m.x)
Alcohol .....	60.	(3ij)

Temporary relief may usually be obtained from a weak galvanic current.

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## THE SIMPLICITY OF MODERN SURGERY.

It is gratifying to be able to feel that a very simple cosmos is shortly coming out of the dreadful chaos in which surgery has been for the last thirty years. It was a prodigious effort for the great surgeons who are now all but passed away, to assimilate, to practise, and to teach the overwhelming changes which have come within that time. They occupied an unenviable position in that they were obliged to graft upon the teachings more ancient than Æsculapius the wonderful revelations of an undreamed of science. Very naturally none or almost none of them were able to disentangle themselves from the old, from the useless, from the dross that had been handed down to them from the past centuries. Even modern text-books of surgery, which are written by the students of this great generation of men, are still encumbered by much that is old, ill timed, and useless.

Starting with the assumption that asepsis has made all things possible in surgery, it is exceedingly interesting to note what sweeping changes have been made in time-honored operations by the perfection of some simple technic or the introduction of an insignificant instrument. When Reverdin and Thiersch taught that the transplantation of skin grafts was a simple matter, they

little dreamed how destructive the application of their experiments would be on many operations that had been considered impregnable in their perfection. Take for example the modifications wrought by this innovation in the technic of amputation of the breast. It has done away here as in many other cases with plastic surgery.

Not as important as this from the standpoint of saving life, but of great value in giving to the living longer, and therefore more useful, extremities after amputation, is the application of skin grafting to the stump following the removal of fingers and of toes. In many cases, even relatively proximal amputations are finished by skin grafting instead of by the use of the classical flaps. This effects a saving of perhaps ten per cent. in the length of the part.

Finney has taught how unnecessary are the complicated operations for that minor but grievous disorder, ingrowing toe-nail, all requisite being a shaving away of the nail and soft tissues followed by skin grafting. So grafting is seen to modify surgery as well as other arts.

An immense amount of space is devoted to such classic works as Pancoast's Operative Surgery, to the methods of ligating arteries in their continuity. Page after page deals with the problem of arresting hemorrhage. How rarely do we see an artery tied to-day proximal to the seat of trouble and how easy it is to control the flow of blood with our hemostatic forceps.

It is, perhaps, in the most recent treatment of peripheral aneurisms, that we can recognize, better than elsewhere, the simplicity of the modern trend. The Greek, Phillagrius extirpated the sac in toto. Antyllus left it in situ, ligating above and below. Hunter, Anel, Brasdor, Wardrop, and others selected special points at which to tie. Tufnell, of Irish fame, recognizing the futility of all existing treatments, proposed that all aneurisms be treated by the formula: "Rest, starve, purge and K. I." It never occurred to anybody that the simplest treatment was to open the sac, ligate the lumina which lead to the vessel and obliterate the cavity by a few simple stitches, thus curing the disease without interrupting the potency of the artery. This has very recently been successfully practised by Matas of New Orleans. For thirty years asepsis had made such a technic possible but the yoke of the old treatments clings so tightly that progress is painfully slow.

We are arriving, however, and the students of ten years hence will not have to unlearn so much surgical dross as it has been our lot to do.

**PNEUMONIA'S INCREASING VICTIMS.**

THE fatal months of the year, that is, the months in which the most deaths occur, are March and April. This is of course for adults, for, as is well known, for children under five years of age, July and August are the special death months. Practically all the statistics show March to be the most fatal month of the year, but, curiously enough, April is a very close second. When we consider how presumably unhealthy are the colder blustery winter months, from December to February, it may be somewhat of a surprise to find April with so bad a reputation. The month deserves it, however, mainly because of the large number of deaths from pneumonia which occur during this changeful period.

Pneumonia is coming to occupy an ever more and more prominent place in the mortality list of our large cities. Even in the last three years there has been a distinct deterioration of conditions, so that a still higher death-rate from pneumonia is found to exist than even in 1900. The Chicago Board of Health made a public statement not long ago that since the census year, 1900, pneumonia has claimed more than one-eighth of all the victims of the Grim Reaper in Chicago, one-third more than consumption and 46 per cent. more than all the other contagious and infectious diseases combined, including diphtheria, erysipelas, influenza, measles, puerperal fever, scarlet fever, smallpox, typhoid fever and whooping cough." The total number of deaths from all these diseases, during 1901 and 1902 was only 4,489, as compared with a total of 6,562 deaths from pneumonia.

Since pneumonia has thus become "the captain of the men of death," to use Professor Osler's expressive phrase, replacing consumption, which had occupied that bad eminence for so long before, it is important that prophylactic measures should now be directed mainly to the reduction of pneumonia mortality. The task is not an easy one and looks by no means promising, but twenty-five years ago to have announced that the reduction of the mortality from consumption must be attempted would have seemed quite as hopeless a task. At the present time, however, the consumption mortality has diminished about one-third on the average in the large cities of this country and the outlook for further favorable progress in this matter is most promising. Doubtless the same thing will be true of pneumonia, if persistent and concerted effort is made, with the proper realiza-

tion of what the elements of danger with regard to the disease really consist in.

Pneumonia is most fatal at the extremes of life, among the very young and the very old. These classes of individuals then must be guarded as carefully as possible from infection and contagion and must never needlessly be allowed to associate with those who are suffering from pneumonia, or be brought in contact with any of the discharges from the lungs of such patients. This may seem a needlessly refined precaution, or rather it may seem pushing precautions entirely too far. Twenty-five years ago the same objection would have been made to the taking of similar precautions with regard to tuberculous sputum. Now regulations insisting on the utmost care with regard to expectorated material are accepted as the only rational course to pursue. It is well known that pneumonia, no matter what its cause, in a hospital ward containing a number of young patients, is likely to affect several of them in succession and while not virulently contagious, there is surely a contagious element present.

The deaths from pneumonia among adults usually occur under special conditions. Fatal cases occur typically in individuals who contract pneumonia while suffering from kidney or heart trouble. It is well understood that among the middle-aged, according to the familiar expression, it is not the pneumonia itself that is dangerous, so much as what the patient takes into the pneumonia with him. Patients suffering from heart disease or nephritis, should be warned to avoid, especially in the springtime, what are now generally conceded to be the occasions of pneumonia. They should, during unsettled weather and particularly while pneumonia is prevalent, avoid, as far as possible, getting into crowds in cars or depots and the like, and should not frequent crowded theaters and other overheated public places. These precautions are especially necessary for those who have once suffered from pneumonia, as it is well understood that the disease, far from conferring immunity, rather produces a predisposition to recurrence.

Another important factor in the mortality of pneumonia is the delay so often foolishly presumed upon by young and otherwise healthy adults, in giving up their ordinary avocations and recognizing that they are ill. A patient who walks about until the third or fourth day of a pneumonia, no matter how robust his previous health, will surely succumb to the disease. Family physicians should make it a rule to warn members of

families under their care that the occurrence of a chill after a few days' uncomfortable feelings, followed by some febrile temperature, should be the signal for remaining in bed until the physician's permission has been obtained to go out again. This simple rule, if faithfully followed would save many a life. The exhaustion consequent upon even slight muscular effort during the initial stage of a pneumonia is enough in itself to make an otherwise mild case likely to be fatal.

There is and remains a curious coincidence, at least between the curve of frequency of pneumonia and the occurrence of windy days, during which dust is blown about. It seems not unlikely that this points to the necessity for our municipal health authorities taking care to lay the dust and by efficient street cleaning preventing the accumulation of material that may prove pathogenic when inspired. A dustless city is no utopian dream, and will some time surely come. Meantime it is to be hoped that the enforcement of the regulations against expectoration in public places, which has been begun in very serious spirit of late years, will be continued. Pneumonia is no accidental occurrence. The germ may be present and virulent, but there seems no doubt that every opportunity given for its distribution is an invitation for the spread of the most fatal disease with which we have to deal at the present time.

#### MEDICAL JOURNALISM.

THOSE of us who are still wrestling with the problem of how to supply a sufficient quantity of literary pabulum to our medical brethren feel a touch of envy at the slippered ease of our whilom contemporary, Dr. James C. Johnson who, until recently edited and managed the *Journal of Cutaneous and Genito-Urinary Diseases*.

He indulges in a little retrospect of medical journalism in the columns of the *Philadelphia Medical Journal* and cleverly sets forth an editor's "struggles with printers, photo-engravers, lithographers, paper-makers, post-office authorities and non-paying debtors."

It is a heart-to-heart talk that reveals the editor to the contributor, and both to their readers. He admits the fact that we do not write all our own editorials and book-reviews and abstracts, and that we are publishing about twenty-five times as many journals as our readers really need.

He voices our own opinions when he says "Circumnavigation of the circumambient is a favorite

pastime of medical authors." "A meaner man than the one who married on Christmas day a girl whose birthday was the twenty-fifth of December is he who sends his article to all the journals he knows of at once, and prays for an immediate hearing."

He touches the author's heart when he says, "The best reviewer is one who not only knows the subject, but has written on it, if possible, a book. His justice is then tempered with mercy. Destructive criticism is almost the easiest of literary pyrotechnics and, while it may be a choice spectacle, there is nothing left but aerial smoke."

As he tritely remarks, "Journalism is, like eczema, a blood disease, and can rarely be cured in a lifetime;" so those of us who are undergoing the throes of editorship are only hoping that Dr. Johnson will have another attack.

#### ECHOES AND NEWS.

##### NEW YORK.

**Eastern Medical Society.**—The Eastern Medical Society held its Annual Reunion at the Hotel Marlborough, Saturday evening, March 28, 1903.

**City Consumption Camp.**—Commissioner Lederle of the Health Department sent to Mayor Low Monday a letter urging the establishment of a sanitarium for the treatment of tuberculosis on the tent and ducker plan, on a tract of twenty acres in Orange county, which has been offered to the city for two years, without rent. Dr. Lederle says that 8,883 persons in this city died from lung diseases in 1902, and 8,135 in 1901. The time has come, he says, when the city should increase its facilities for treating tuberculosis. He has been much impressed by the opinions of leading physicians with regard to the efficiency of the open-air treatment, but the plan of the Charity Organization Society's committee for a tuberculosis sanitarium and camp is too elaborate and costly. With the appropriation of \$35,000 he could operate a camp for sixty patients on the Orange county tract from May 1 to Dec. 31 next. The occupation of this ground will cost the city nothing, and if the outdoor treatment suggested should prove successful he predicts there will follow a development on a large scale of this method of dealing with tuberculosis.

**The Late Dr. T. Gaillard Thomas.**—At a meeting of a committee appointed by the Medical Board of the New York Infant Asylum held March 30, 1903, the following resolutions were adopted:

*Whereas*, The late Dr. T. Gaillard Thomas for several years and at the time of his death was a consulting obstetrician of the New York Infant Asylum and President of the Medical Board, an office in which he exhibited wise counsel and charming geniality, and

*Whereas*, Dr. Thomas was a man of great eminence, well known to the medical profession throughout the world, by virtue of whose character and renown much honor was reflected upon this Institution, therefore

*Be it resolved*, That the Medical Board of the New York Infant Asylum record the death of Dr. Thomas

with a sense of deep regret and inexpressible loss, and further

*Be it resolved,* That a copy of these minutes be sent to the bereaved family, and to the principal medical journals, and inscribed in the records of the New York Infant Asylum. Signed: J. Milton Mabbott, M.D., George Tucker Harrison, M.D., Committee.

#### PHILADELPHIA.

**New Hospital for Frankford.**—The charter for a new hospital on Frankford avenue, to be known as the Frankford Hospital, has been granted. The Board of Trustees are physicians who are also members of the medical staff. The question of erecting a modern hospital building in place of the present quarters will soon be considered.

**The Evans Dental Museum.**—Settlement of the various suits instituted against the estate of Dr. Thomas W. Evans, the well-known Philadelphia dentist, who died in Paris about five years ago, and who left the bulk of his property, valued at over \$3,000,000, toward founding a dental institute and museum in this city, having been effected, a meeting of the directors of the corporation formed to look after the details was held March 30. This meeting was for the purpose of devising means for carrying the testator's will into effect. The proposed institute and museum, which will contain all the valuables and souvenirs that were given to the testator by nobility, will be located on property belonging to the estate in West Philadelphia.

**Colleges Secure Amendment of Pennsylvania Medical Bill.**—Through the efforts of a large number of educators and some physicians, the Ray Medical Council and State Board of Medical Examiners Bill, which had already passed the House, has been amended in the Senate. The principal objections to it was that, as it passed the House, it robbed every small college of the State of the right to have its graduates receive credit in any medical college for one year of scientific work. Under existing conditions students from colleges are entitled to enter the second year of any medical college in the State. Under the original Ray Bill this privilege was withdrawn, and before a student could enter a medical college, he was compelled to present a diploma from a high school or college, and without the accompanying reduction of one year. Since the bill reached the Senate it has been amended to read as follows: "Provided that a graduation from a literary college of good standing after two years of scientific work in the college shall be accepted by the Medical Council of the State of Pennsylvania as an equivalent for the first year in a recognized medical college, provided that it is accepted by the medical college as dealing adequately with chemistry, physics, physiology, anatomy, and the biological sciences."

**The Choice of an Anesthetic.**—In a paper on the above subject read at the County Medical Society March 25, Dr. G. G. Davis said that the choice depends largely on custom and environment, but the surgeon should avoid the routine use of any one anesthetic. Dr. Davis at one time felt that ether was the anesthetic of choice, unless there was a distinct indication for chloroform, but was afterward convinced by certain cases, two of which he detailed, that ether can and does kill. Hence, it cannot be regarded as absolutely safe. The writer prefers anesthesol to chloroform. Ether should be used where shock is liable to be a complication. Nitrous oxide before ether is a valuable adjunct if rightly

used. Closed etherization should never be employed except by those who are expert in the use of that method. Bromide of ethyl is not to be recommended. In closing, Dr. Davis called attention to the value of primary anesthesia in minor operations.

**Preparation of the Patient for Anesthesia.**—This phase of the subject of anesthesia was considered by Dr. J. G. Clark, who said that the principal danger in anesthesia was from the anesthetic in the junior assistant's hands. Hence the employment of a definite salaried anesthetizer is the chief point to be looked to as diminishing the danger to the patient. The benefit of this method has been well demonstrated at the University hospital since it was instituted nearly two years ago. Regarding the actual preparation of the patient, Dr. Clark said that many patients were now operated upon within 24 hours after coming to hospitals, which meant that many functions were overlooked in the necessarily hurried preparation. The organs to be particularly examined are the lungs, heart and kidneys. An acute coryza, even in the subsiding stage, is a dangerous condition, and hence a contraindication to operation. Pneumonia has followed anesthetization in some of these cases. On the other hand chronic bronchitis of several years' standing, instead of being a contraindication, has been seen to clear up under even a prolonged anesthesia. As to the condition of the blood, the complexion index is usually taken as a reliable indicator. Rather severe anemias have not acted so as to make them a serious contraindication. The most vital point is the condition of the kidneys. In this connection Dr. Clark states his belief that the danger of terminal infections following operation upon persons with faulty kidneys is greater than that from the actual anesthetic. Such infections have caused death in some cases. Hence the bowel and kidneys should be evacuated before operation, not so much because of the contents themselves affecting anesthetization processes as for their possible favoring of subsequent infections. Calomel in broken doses should be given the evening before operation, and enemas about two hours before. Water in large quantities may be ingested in order to flush the kidneys up to two hours before the anesthetic is given or even just before it is begun.

In discussing the question of anesthesia, Dr. W. L. Rodman stated his belief that surgeons were remiss in allowing the least experienced hospital resident to give the anesthetic. The stomach of the patient should be empty when the anesthetic is begun, hence he would not sanction the taking of water by the patient as mentioned by Dr. Clark. No tongue instrument should be used by the anesthetizer. No general anesthetic should be given in cases of empyema. Chloroform is safer at times than ether, and even in this latitude is perhaps better in many instances during the hot season. He has never seen a death from ether primarily, but has seen deaths resulting secondarily. If the secondary as well as the primary deaths due to ether are counted, it is a question if the entire number is less than those due to chloroform. The difference between these two anesthetics, in Dr. Rodman's opinion, is not so great as it is commonly said to be.

**Some Observations Concerning the Physical Characteristics of Nutrient Gelatin.**—As the guest of the Philadelphia Pathological Society March 26, Dr. Edward K. Dunham, of New York, spoke of the physical characteristics of nutrient gelatin with special reference to their influence upon colonies of bacteria. A series of lantern slides were shown as illustrations. Dr. Dunham said that it had always

been a perplexing question as to why colonies of bacteria were often so different on different gelatins, and this fact had led to the studies detailed. The observations were confined to deep colonies of non-liquefying organisms. The principal difficulty presenting is that of measuring the density or "stiffness" of the gelatins employed, as this depends on the quantity, quality, amount of heating, etc. Many methods were employed to determine this point, and finally the viscosity of the gelatines when melted was selected as the one giving the most satisfactory results, though this is by no means free from objection. The instrument devised for measuring this property is based on the principle of passing 15 c.c. of the melted medium through a capillary tube, and taking the time as compared with the passage of an equal quantity of water. The principal objection to this method is that it deals with the melted medium instead of with the solid form as desired. The object of the experiments was to determine the differences of growth as caused by different physical conditions of the media, and thus help in distinguishing species of organisms. The differences were well shown by the lantern slides presented. The subject has not been thoroughly worked out, but gives promise of being a valuable aid along the lines mentioned.

**The Development of the Islands of Langerhans in the Human Embryo.**—Dr. Richard M. Pearce detailed the results of a study made upon 21 human embryos, varying in age from seven weeks to seven months. The pancreas from each was carefully studied, the series giving a view of the development of that organ that is rarely obtained. In the earliest stage studied, that is, in a seven weeks' embryo, there is seen at a certain part of the periphery of the tubules a distinct proliferation and differentiation of cells. These areas lie in the concavity of the tubules, and the cells stain deeply. In embryos from eight to ten weeks, there is seen evident vascularity of these proliferated areas. At the end of three months these processes are separated from the acini, and there is a solid mass of cells connecting the islands with the gland acini, from which it was derived. At this stage there is distinct vascularity, the vessels coming from all sides instead of from one side only, as in the Malpighian bodies of the kidney. This stage is followed by the separation of the island from the acini, connective tissue appearing and completing the separation. The study of a pancreas from a syphilitic embryo of seven months, showed practically the same condition as that presented by the pancreas of a normal embryo at three months. The connective tissue of the organ in question equaled or exceeded the gland structure, this probably leading to arrest of development. Further stages in the development of the pancreas are not of special interest in this connection, the principal change being the surrounding of the islands by the gland tissue. This study furnishes an anatomical basis for the idea that the islands of Langerhans have a distinct function.

#### CHICAGO.

**Influenza.**—This disease is still rampant, and is largely responsible for the higher death-rate of the winter. It continues to be reported as a fatal complication of consumption, Bright's disease, pneumonia and heart disease among the aged, and of the acute contagious diseases of childhood.

**Frederick Mueller to Locate in Chicago.**—Dr. Frederick Mueller, former assistant to Dr. Lorenz, has returned to this city, and hereafter, according

to the daily press, will practise the specialty of orthopedic surgery.

**Pneumococcus Septicemia.**—At a meeting of the Chicago Medical Society, held March 25, Dr. J. L. Miller read a paper on this subject. He said that bacteriemia was a more suitable term than septicemia. Whether an infection remains localized or becomes generalized depends largely upon the resistance of the individual, and the virulence of the infectious agent. The diplococcus pneumoniae inoculated into a highly susceptible animal, as the mouse and rabbit, does not manifest itself as a localized process, but becomes a bacteriemia. In less susceptible animals, when inoculation is made directly into the lung, a process resembling pneumonia follows. Pathological findings, animal inoculations and clinical observations indicate that pneumonia is often a septicemia before blood cultures actually demonstrate the organism. Two investigators report positive cultures from the blood in all cases examined; 154 cases collected from other reports show positive results in 24 per cent. The earliest positive results were obtained upon the second day of the disease. Blood cultures will be of little diagnostic aid, as the disease is easily recognized from the physical findings. From a prognostic standpoint, it is of value, a bacteriemia indicating a grave infection. Eighty-seven per cent. positive cases died, and only 22 per cent. of the negative cases.

**The Diagnosis of Pneumonia.**—Dr. Arthur R. Edwards read a paper, at the same Society, on this subject. He said that mistakes are rare in the diagnosis of primary frank pneumonia in adults. They occur mostly in the aged, alcoholics, children, and in pneumonia secondary to cancer, nephritis, diabetes, etc. Therefore, the physician should watch all diseases when the respiration, pulse and temperature rise, or when, even without these or other symptoms, the subject of chronic disease is not doing well. The onset symptoms, the chill in adults, convulsions in children, vomiting in the very young or in adolescents, suggest at least the possible onset of lobar pneumonia. Chill, pain in the side, sudden high fever, and rusty sputum are almost positively final, since pneumonia is practically the only disease where they occur, guarding against the chief diagnostic confusion, infarct of the lung, in which the same symptoms may obtain, although here the sputum is reddish, but is not viscid, and is usually far more abundant than in pneumonia.

As to diagnosis from the physical findings in the lungs, these findings are usually detected in the frank case of pneumonia on a thorough thoracic examination, and as a rule appear within two days after the characteristic symptoms of onset. These physical findings were detailed.

The author presented a table differentiating pneumonia from effusive pleurisy.

Pneumonia in children occurs with an abrupt onset without chill (before the seventh year), but with vomiting or convulsions or other cerebral or meningeal symptoms. Cough is absent since the bronchi are not involved; no sputum appears, and pain from the third to the fifth year; or, indeed, later, and also in adults, is referred to the abdomen, but without tenderness there. Pain is more important than increased respiration, which occurs with any elevation of temperature. Respirations number 80 under two years; in older children 50 or over. Crepitant râles are usually absent, because of the superficial breathing caused by pain. Latency of signs is sometimes noted, as no bronchial breathing, no bronchophony, no dulness. Localization is more often central, in

the upper lobes or migratory. Lysis is more frequent than in adults. In children pneumonia may be mistaken for abdominal disease, for pleurisy, or brain affections. In alcoholics the disease is insidious, often without pain, cough or sputum, etc., and the lung symptoms may be overlooked, since the clinical picture of delirium tremens masks the signs of pneumonia.

Pneumonia secondary to tuberculosis, emphysema, arteriosclerosis, hepatic cirrhosis, nephritis, diabetes, typhoid, influenza, diphtheria, anesthesia by ether, etc., is most frequently overlooked, and the greatest care in chronic cases is necessary. Sudden death here, and in general, is often pneumonic. Of other variations in the clinical course, the author mentioned the rarer forms, as abortive pneumonia, ephemeral pneumonia, relapsing or recurrent pneumonia. He discussed delayed or imperfect resolution; also local variations; massive pneumonia, etc., and as a final general statement he said that few diseases are recognized as easily as is fibrinous pneumonia, when careful consideration is given to its onset, symptoms, signs and evolution, and when no symptom of pneumonia presenting, the patients with other disease are carefully, systematically and repeatedly examined.

**Treatment of Pneumonia.**—In discussing the previous paper, Dr. James B. Herrick referred particularly to certain erroneous practices in the treatment of pneumonia, and argued for a simpler therapy and less free use of drugs. The expectant and symptomatic treatment was, for the present, seeing no specific remedy is known, the only rational one. The physicians can educate the laity to a knowledge of the self-limited nature of pneumonia, and a treatment as scientific as that in typhoid will be possible. He urged that oxygen be allowed to come in through the window, and not given entirely from the tank. No hard and fast rule as to diet should obtain; there should be individualization in this regard. Alcohol was seldom necessary. Hydrotherapy was proper for the reduction of temperature. Salt solution was of value, but its use ought not to be deferred until the patient is *in extremis*. Morphine was the best remedy to relieve pain and induce sleep, though it should, of course, be used with caution. Local applications were of doubtful value. They should not be so heavy or so light as to embarrass respiration. Bleeding was occasionally of benefit. The giving of many drugs for each trifling symptom was not indicated, and was often harmful. There was danger in the too free use of stimulants.

#### CANADA.

**Appointment.**—Dr. J. M. Elder, Montreal, has been appointed by the Board of Governors of McGill University, Associate Professor of Surgery and Lecturer on Clinical Surgery in the medical department of McGill University.

**Montreal Physicians to Speak in Churches.**—It has been arranged by the Protestant Ministerial Association of Montreal that meetings shall be held in the Montreal churches in May, which will be addressed by leading physicians of that city on the subject of tuberculosis, and how best to prevent its spread.

**Medical Inspection of Schools in Montreal.**—Dr. C. H. Church, of Montreal, recently read a paper on "Montreal Schools and the necessity for medical inspection of them," before the Social Science Department of the Women's Club of that city, in which he advocated medical inspection of the city schools, as after paying a visit of inspection to each of them, he

had found conditions present both dangerous and unsanitary. Referring to one school where there were 600 boys belonging to the laboring classes, "a more disgusting place," said the doctor, "I never entered." As the opportunity generally presents itself during a professional career of a doctor entering some pretty "tough joints," the conditions present in the schools of Montreal must be very bad, indeed.

**Contagious Diseases Hospital in Montreal.**—Notre Dame Hospital, Montreal, which has agreed with the Montreal City Council to care for all cases of infectious diseases arising in the French quarters, has selected its site, which embraces 52,000 square feet, and which cost \$15,000. The Board of Management of the Notre Dame Hospital is to receive from the City Council the sum of \$15,000 annually for the purpose of maintaining this new institution.

**An Academy of Medicine and Doctor's Club for Toronto.**—For some time past there has been a movement among the progressive physicians of Toronto looking towards the amalgamation of the existing medical societies, the Toronto Clinical Society, the Toronto Medical Society, the Toronto Pathological Society with the Ontario Medical Library Association, and the establishment in connection with an Academy of Medicine, of a doctor's club. As several prominent practitioners in Toronto are interesting themselves in this laudable undertaking, the proposal will no doubt meet with success. It is understood that a fine residence in the centre of the city is being negotiated for, and that decided action will shortly be taken.

**Canadian Medical Association.**—The thirty-sixth annual meeting of the Canadian Medical Association will be held this year in London, Ontario, under the Presidency of Dr. Walter H. Moorhouse of that city. The dates selected are August 25, 26, 27 and 28. Dr. James Stewart of Montreal, Professor of Medicine in McGill, will deliver the Address in Medicine; Dr. Alexander Hugh Ferguson, the Address in Surgery, and Dr. Matthew D. Mann, the Address in Gynecology. Arrangements are said to be getting well in hand at this early date, and it is expected that this year's meeting will equal if not surpass all other previous meetings.

**Ontario Medical Association.**—The annual meeting of the Ontario Medical Association will be held this year in Toronto on June 16, 17 and 18. Dr. J. C. Mitchell, Toronto, is the President, and Dr. H. C. Parsons, Bloor St. W., the secretary. Dr. Musser of Philadelphia, and Dr. Thos. Cullen, Baltimore, are to be present and contribute papers. Papers and business are to be in charge of Dr. W. P. Caven, Toronto, while entertainment and arrangements are to be in charge of Dr. Bruce L. Riordan. During the meeting there will be a discussion on arteriosclerosis. This will be the first meeting of the Ontario Medical Association of three days' duration.

**Dr. William Bayard, St. John, N. B., Honored.**—Very recently, Dr. William Bayard, of St. John, N. B., one of the oldest medical men in Canada, severed his connection with the St. John Public Hospital after a service extending over 40 years. The municipal council of that city took occasion to present to Dr. Bayard as a tribute of regard and public esteem, a resolution handsomely engrossed on parchment. Dr. Bayard was graduated 65 years ago. He is a past president of the Canadian Medical Association.

**Obituaries.**—Dr. D. Gilbert Gordon, Professor of Hygiene in Trinity Medical College, Toronto, died

at Johns Hopkins Hospital, Baltimore, on Jan. 28, of tubercular peritonitis. Deceased, who was in the prime of life, enjoyed an extensive practice in Toronto, and was a past president of the Toronto Medical Society. He was formerly a master at an Upper Canada College, and held the degree of Bachelor of Arts from Toronto University. He was an M.D., C.M. of Trinity University.

Dr. Andrew Halliday, associate professor of pathology in the Halifax Medical College, died on March 10, from tuberculosis. He was only thirty-six years of age, but was considered one of the bright medical minds of Nova Scotia.

#### GENERAL.

**Missouri State Medical Association.**—The next regular meeting of this association will meet at Excelsior Springs, April 21, 22, 23. A large and interesting program is planned.

**Florida Medical Association.**—The thirteenth annual meeting will be held at St. Augustine April 8, 9, 10. An interesting program is presented. Dr. McCormack will address the association on the Reorganization of the Medical Profession.

**Fourteenth International Medical Congress.**—The French railroads have made their rate reductions for the members of the International Medical Congress depend on a special certificate, and on the use of the same route for going and returning. Any member of the Congress to whom this is of interest should therefore write immediately to the Secretary General at Madrid, stating at what port he expects to land, and what route he will take. The Secretary-General will send to him at the port named under the address *poste restante*, the necessary certificate.

**Insurance of X-Scientist.**—Richard A. Robb, a Christian Scientist, died a month ago of jaundice. The proofs sent to the Supreme Court of Foresters for the widow's claim under his \$1,000 policy showed that although he was seriously ill for two weeks a physician did not attend him until the day before his death. The Foresters have rejected the claim under the section of their constitution which withdraws the benefits of insurance from any who neglect to procure or refuse to receive medical aid.

**Woman's Brain.**—In a recent letter to the *Sun*, we find: "In your issue of March 22 there is an article entitled 'Man's Superior Brain.' The caption is a misnomer, for on reading the text of the despatch from London thus proudly headed, we discover that the claim is not that man's brain is really superior to woman's in any way except in weight. Prof. Marchand of Marburg, who sends forth the valuable information that even in childhood the brain of the masculine human being is of more weight than that of his sister, has examined more than a thousand cases—always with the same result. If he had made an equally painstaking comparison of the feet of the male at all periods of life he would undoubtedly have discovered that the average weight of the masculine extremities was greater than that of the Cinderella sex.

"We have always understood that it was the quality and not the quantity of the brain that indicated mental power, and that the preponderance of the finer gray matter was greater in the average feminine than in the average masculine cranium. There is one vital consideration that must always be remembered in comparing the brains of the two sexes, and that is that while many of the greatest men have bequeathed their skulls to the investigation of science and thus the brains of Cuvier and of Car-

lyle and of many other distinguished persons have been examined and analyzed, thus far the feminine brains available for study have been those of women who died in the hospitals, often the outcasts and refuse of the sex. Could the brains of George Eliot, of Harriet Martineau and of other women like them have been critically considered we should have some new light on the question of the superiority of the feminine or the masculine sensorium.

"It is said that in ancient times when the lower animals and men could converse together, an artist who had just completed a picture which displayed a lion prostrate at the feet of a man asked a friendly lion who was passing to come in and view his masterpiece. The king of beasts considered it for a few moments gravely, and then said: 'Just wait till lions paint pictures.' It is possible that in some future day when women are permitted to have equal facilities with men we shall find a distinguished feminine scientist proclaiming to the world that the unnecessary amount of white matter which clogs the male cerebrum accounts for the stupid or 'fat-witted' condition of many masculine minds.

"Even among men it has not always been the 'big head' that has contained the most valuable amount of intellect and the compact occiput of a Jefferson, a Grant or a Platt may contain brains of more value than many a dome-like brow belonging to the unknown of their generations. It is a fact that should by this time be conceded, that superiority of mental ability does not belong to either sex alone, but that women and men as they suffer or enjoy alike the hardships or the pleasures of life are in like manner gifted or deficient in their mental characteristics."

**Healing by Prayer Lawful in Old North State.**—Christian Scientists all over the country say that there was a great victory for their cult in the defeat last week in North Carolina of an attempt to prevent by law the practice of faith-healing in the State by Christian Science practitioners. The bill as drawn up at the request of the State Superintendent of Health, who had the support of the majority of the medical profession of the State, sought to do this by defining the practice of medicine and surgery to be the treatment for fee or reward of any cases of disease, "physical or mental, real or imaginary," with or without drugs, surgical operation or by any other method whatsoever, and prescribing the usual qualifications of physicians as those necessary to obtain a license so to practise. The purpose of the bill was defeated after one of the hardest fights yet made by Christian Science by the adoption as an amendment of a provision specifying that the act should not apply "to any person who ministers to or cures the sick by prayer to Almighty God without the use of drugs or material means."

**Obituary.**—Dr. Robert Safford Newton died last Monday after a brief illness. Dr. Newton was in excellent health up to last Friday. He attended a dinner party last Thursday evening and the next day became ill. Physicians were called, and what at first was thought to be an attack of the grip developed into spinal meningitis. Dr. Newton's condition grew steadily worse and the end came soon after one o'clock yesterday morning. Dr. Newton was a bachelor. He was born in Cincinnati, Ohio, and was forty-five years old. His sister, Mrs. Mary Potter, made her home with him. He was a well-known alienist. He testified as an expert in the Barberi and the Hannigan murder trials, as well as in the Molin-eux case.

## CORRESPONDENCE.

## OUR VIENNA LETTER.

(From Our Own Special Correspondent.)

VIENNA, March 14.

THE event of all recent events in the medical world of Vienna has been the lecture which was delivered by Prof. Behring upon "The Struggle against Tuberculosis." Not quite ten years previously Behring had made his earliest announcement regarding his discoveries in the treatment of diphtheria before an audience of scientists in this same city—strange to say, far from the borders of the fatherland in which his work was accomplished. Behring recalled this fact to his hearers with something of emotion; that was at a time when the ideas of the medical world upon the subject of bacterial toxins and antitoxins were very largely inchoate and nebulous, when the attitude of the most scientific men toward the problem of immunization and antitoxinization was prejudiced and pessimistic. Even Behring himself had not come to regard his achievement in the light of an incontestable and proven fact. Yet in those early days his Vienna audience greeted his tentative announcement almost with an ovation. During the succeeding months of trial and probation, he received his warmest support and encouragement from the members of the Vienna school, among whom he touchingly referred to Widerhofer, since deceased. To-day all this is changed, and v. Behring stands before the world, in the words of Prof. Schrotter, a conqueror; the practical value of the diphtheria antitoxin is established, and the reputation of its discoverer is far beyond cavil. But Behring had not forgotten, and accepted with alacrity the invitation of v. Schrotter, to describe his work and his theories, in so far as they bore upon the treatment of tuberculosis in mankind. It was generally expected that the lecture would prove epoch-making, nor was the hope disappointed. The amphitheater of the clinic was packed to double its capacity, with Hofraths, professors, docents, and students, and as many more were turned away in disappointment. In the audience we recognized Neusser, Nothnagel, Lorenz, Weichselbaum, Paltauf, and the venerable old dean, E. Ludwig. Prof. v. Schrotter, the chairman, introduced the speaker of the evening in a few words of praise, which was none too fulsome; Behring himself was greeted with round upon round of applause, the audience standing up in its enthusiasm. He looked a very young man, by no means the fifty years which stand to his credit, and had the grace and strength of a military bearing. He spoke in rather a low voice, and very deliberately and slowly, as though to weigh every word of his discourse. The substance of his lecture was as follows:

Von Behring began by deprecating the fact that he had been heralded as the discoverer of a "serum" potent against tuberculosis. In 1901, he had, indeed, delivered a lecture in Stockholm upon "Methods of Combating Tuberculosis in Cattle," but had laid no claim to the discovery of a specific serum. In fact the trend of his theories has had an entirely different direction.

He then passed on to a review of his work upon the immunization of cattle, which he said might practically be regarded as completed. The immunizing material, the preparation of which has already been described, is obtained from cultures of the human bacillus, and is injected into the cervical vein of the cow. The dose ranges from 4 to 10 milligrams. Behring made the observation that various animals responded very differently to the same dose of the toxic material. Calves of four weeks rarely evinced any reaction; animals of the age of seven months and over occasionally developed fever and general constitutional symptoms, which were

not clinically of any great severity. After the age of one year the reaction might be severe in the extreme, with clinical and pathological evidence of the involvement of the important viscera. Von Behring stated that these results were closely comparable with those obtained by the injection of tuberculin of Koch in which a reaction to small doses is indicative of the existence of tuberculous focus within the body. In the case of the toxic material employed by him also, it had practically been proven, both experimentally and pathologically, that reaction denoted the existence of a previous focus of infection. At all events, the actual deduction to be drawn from the facts as hitherto collated was, that immunization should be practised upon animals ranging in age from one to three months. And in fact, this practice had met with all success, and seemed to be associated with no danger.

The calves which were treated in this manner were subsequently tested in comparison with other control cattle, and evinced a marked immunity to tuberculous infection. The nature of this immunity is an extremely important matter. It is not due to the existence of antitoxins in the sense in which that word is used of diphtheria. It is well known that in the latter disease, the symptoms are in greater part due not to the bacteria *per se*, but to the action of the toxins which they set free in the circulating blood. The diphtheria antitoxins, whether spontaneously elaborated by the organism or artificially introduced from a foreign source, serve only to bind or neutralize these toxins. In tuberculosis, as in many other infections, it is not only the toxin but the organism itself which must be combated, and it seems extremely probable that the cattle immune to tuberculosis possess within their bodies, in all probability in the circulating blood, substances inimical to the growth and existence of the tubercle bacillus, as well as related to the poisons which it produces. The immunization of calves is a settled problem; that of human beings is, however, an entirely different affair. It is extremely improbable that men will even consent to the immunization of their offspring by the injection of attenuated cultures of bacilli, or of anything of the sort. There is, however, a very different method of surmounting this difficulty. By analogy with recent observations in connection with other sorts of antibodies and antitoxins, we are entitled to assume that the immunizing material is to some extent excreted in the milk of the primary individual, and is therewith transmissible to the offspring, thus achieving a secondary immunity. If then the human nursing were to be nourished in whole or in part on the milk of immunized cows, it seems not unreasonable to believe that it would come to share the immunity of its foster parent. This is a theory the test of which will, however, demand a vast multiplicity of observations and years of time. One fact, at all events, is clear, and this is, that the period of infancy is the time during which, if at all, the human being will have to be put to the test. For not only is it probable, from our past experience with animals, that the more mature individuals will prove refractory to the process, but we are confronted by the fact that we must overcome the appalling mortality from tuberculosis in infancy. We are not to believe that this mortality is due to an inheritance of the disease, perhaps not even to an inherited predisposition to it. Probably the sole factor at work is the transmission of the disease to the infant from its mother, or other affected individuals with whom it comes in contact. Particularly the infant is exposed to the baneful effects of such contact. Nor is it possible, by any means in our power, entirely to offset the effects of such contact. They may be diminished, but never overcome by the careful antiseptic measures which have recently been so wisely disseminated. The treatment of the disease it-

self, once it has taken hold of the body, has also progressed wonderfully within recent years; witness the spread of the sanitarium movement in Europe, but it also holds out no hope of ever eradicating the terrible disease. Once and again, it is only through the possession of an antitoxin that the race can expect to make a successful attack upon this, the most terrible of its foes.

After the applause had subsided, Prof. v. Schrotter thanked v. Behring and referred briefly to the sanitarium treatment, with which the lecturer had associated his name. Prof. Nothnagel then proposed that Behring be elected an honorary member of the Society by acclamation, notwithstanding the fact that this procedure was not in conformity with its regulations. Needless to say, there was a furious consensus of opinion upon this motion. Prof. v. Behring was visibly affected, and expressed his thanks and appreciation. The meeting closed amid much congratulation.

#### TRANSACTIONS OF FOREIGN SOCIETIES.

##### German.

PROGNOSIS OF FRACTURES OF THE SKULL—RESULTS OF PLASTIC TENDON SURGERY, WITH SPECIAL REFERENCE TO THE PROCESS OF TENDON REPAIR—THE REFLEX PATH OF TAKING COLD AND OF THE TEMPERATURE DISTURBANCE CONCERNED WITH IT, WITH MICROSCOPICAL DEMONSTRATIONS—TUBERCULOSIS IN FOODSTUFFS.

Herr GRAF, at the Society of the Charity Physicians in Berlin, Feb. 5, 1903, read a paper on the Prognosis of Fractures of the Skull, and among other things, said that in the last seven years there had been observed in the clinic of Prof. Koenig, 90 examples of fractures of the base, 31 per cent. of these died. Forty-eight individuals in all presented themselves for later observation. Of this series, nine have remained, up to the present time, entirely without symptoms; 10 had various slight symptoms and had been incapacitated from following their vocation to some extent; 12 belonged to the class who suffer from distinct symptoms, and were limited to a very moderate capacity for work; and, finally, 17 had extreme degrees of sequelae, and were totally prevented from following their vocation. Among them all, the chief complaints were headache, dizziness, roaring in the ears, weakness of intellect, very frequently decrease in power of initiation. Two were the victims of dementia, and two of paranoia. More frequently the changes in the brain wrought such symptoms as irritability and a muttering, whimsical disposition, and the development of a melancholic tendency. In one subject a tendency to suicide was observed. In about 50 per cent. of all the cases, disturbance in hearing were observed, and of these, 12 showed signs of damage to the labyrinth. The cause of this damage to the hearing seemed to most of those who examined the patients to be due to damage to the brain substance itself either in the cells of hearing or in the paths of hearing.

Herr BORST, at the Physical and Medical Society in Würzburg, Jan. 10, 1903, read a paper concerned with the process of Tendon Repair after Plastic Operations upon them. After a short review of the literature concerning the regeneration of tendons after division of them and after simple suture, and also during the course of inflammation of tendons, the speaker reviewed his own observations concerning the processes of tendon repair after operative interference with them. These cases he had noted in the clinic of Hoffa, in 11 individuals. These notes he desired to add to the paper of Hoffa already published in 1901, in the spirit of a continuation of the discussion. Final and accurate examination of the individuals concerned, Borst has at the present time completed, and brought before the So-

ciety a large number of microscopical preparations and drawings concerning his results. In addition to the experiments of Hoffa, namely, transplantation of one tendon upon its neighbor, lengthening of tendons by a Z-form incision, and abbreviation of tendons by the folding process of Lange and others, Borst has carried the observations further and made a number of tests on dogs, cats, rabbits and frogs. These experiments concern (1) transplantation of tendons upon neighboring tendons; (2) folding after the method of Lange; (3) resection of tendons with suture of the stumps upon neighboring tendons; or with liberations of the stumps in order to investigate the influence of tension upon the functional regeneration of the tendon; (4) local irritation of tendons with nitrate of silver in substance and in 10-per-cent. solution, with the rubbing of soot into the points thus irritated; (5) transplantation of resected tendons into the subcutaneous tissue. Microscopical preparations taken from experiments on dogs and cats by Hoffa were made 14, 24, 42 and 64 days after operation, with the one exception of a preparation from a man, namely the shortening of a tibial tendon by Lange's method, which was secured 242 days after operation. Borst made his series of microscopical preparations 14 days after operation, and thus aimed to complete the original series of Hoffa. For a brief review of the subject Borst's paper was only partially adapted. The subject in detail is treated in an article in *Ziegler's Beiträge zur pathologischen Anatomie*, Band 34.

O. KOHNSTAMM, at the Society for Internal Medicine, in Berlin, Jan. 26, 1903, read a paper on the Reflex Path of Taking Cold, and of the temperature disturbance concerned therewith, and presented microscopical specimens. He stated that the origin of cold was twofold; the physiological, which, through disturbances of external cold brought about a change in the distribution of the blood and the pathological, which usually concerns bacteria, which, according to the individual tendency of the patient, in one case belonged more to one kind, and in another case, to another kind of bacteria. Thus, it is known that some patients, after having taken cold, react regularly with either coughing or sneezing. It is of some interest to determine the path through which the influence of external cold operates and through which the second reflex alteration in the blood vessels travels. The example of sneezing and coughing makes one suppose that this influence of external cold affects chiefly the physiological condition of the breathing center. It is not only through anatomical observations by the author, but also by clinical investigations in unilateral paralysis that he is able to regard as established that the path of temperature and pain passes in the anterior commissure about in the level of the corresponding routes, then cross, and finally pass lengthwise along the anterior commissure in the antecollateral part of the spinal cord, and somewhat obliquely as they pass upward toward the middle bundle of Gower's tract. From these they further ascend in the antecollateral marginal tract of the same column. The reflex fibers of this system end for the most part in the cerebellum; a part of them, however, which leads to the cerebrum end in the terminal part of the temporal system, as fibers of Edinger in the optic thalamus. A further part of this system ends in the *formatio reticularis grisea*, where it breaks up into terminal twigs. In this *formatio* there lies, however, the physiological respiratory center of Gads, with which these paths of temperature just described come into close anatomical relation. He discusses two clinical cases in which zones of softening in the *formatio* existed, and in which a gross paralysis of sensation occurred, so that the paralysis of sensation was present in the trigeminus in the same side but in the opposite side of the trunk.

In the second of these two individuals the author could establish a decrease in the cold sensation and in the pain sensation, but not in the perception of warmth and of contact. The anatomical arrangement cited above illustrates the relation between disturbance by external cold and the breathing center. At present there is wanting only the centrifugal part of the reflex arch. For this the author referred to a disturbance of the sympathetic centers in the medulla oblongata, namely, of the dorsal vagal nuclei of the lower salivatory and of the upper salivatory nuclei, concerning which latter he is to publish notes and further also of the terminal nucleus of the trigeminus and of the vagus. The centrifugal impulse probably from these points excites a vasomotor dilatation in the peripheral distribution, if the opinion of Bayliss concerning the centrifugal paths in the sensible terminal neuron is at all likely.

VON HANSEMANN, at the Berlin Medical Society, Feb. 4, 1903, read a paper on Tuberculosis in Food Stuffs. After referring to R. Koch's well-known dictum, delivered before the Congress on Tuberculosis in London, concerning the difference between human and bovine tuberculosis, and also after stating Koch's publicly uttered wish in the University Clinic that all cases of primary tuberculosis of the intestinal tract caused by foodstuffs should be sent to him, the speaker discussed several cases of primary tuberculosis of the intestine which he had seen during the past seven years. He stated that the demand of Koch that such cases should be beyond doubt caused by foodstuffs was difficult of fulfillment, and that Koch's comparison between tuberculosis of the intestine of this origin and typhoid fever and cholera is hardly fair, because between the time of infection and the appearance of the lesion of the disease in the case of tuberculosis was altogether too long. Pathological anatomy may only establish a site of entrance for tuberculosis, but could not prove the manner in which the virus had reached this point. In averaging up his material, Von Hansemann had found exactly the same number of primary tuberculosis of the intestine as had Virchow in his turn cited in reply to the statements of Koch, namely, three or four each year out of about 1,500 autopsies. During the past seven years, then, Hansemann has seen 25 cases of primary tuberculosis of the intestine. These he discusses, very briefly, in detail, as follows. Most common among them were children or patients who had been sick for a long time of such diseases as cirrhosis of the liver, renal conditions, and the like. Among hepatic cirrhosis he saw four cases of peritoneal tuberculosis without any known entrance for the germs. From this he deduces the supposition that the tubercle bacillus may pierce the walls of the intestine without causing disease therein. The cases of intestinal tuberculosis concerned in part various small lesions in the intestines, and in part various stages of recovery. A few showed very severe results, but never any disease of the lungs. The latter condition he has not been able to establish anywhere in literature. From this he concludes that tuberculosis in the upper part of the intestinal tract, especially tuberculosis of the tongue, is much more common than in reality has been supposed. He has himself found nine cases of this kind which were confused with cancer. Primary tuberculosis of the tonsils he had found only once, but secondary tuberculosis of these glands is comparatively common. One reason why tuberculosis of the intestine is comparatively rare, the speaker stated to be the resistance of this tract to the germs. This is proved by the fact that children, although they are frequently affected with tuberculosis of the lungs, are very rarely the victims of tuberculosis of the intestines, although probably, for the most part, they swallow their sputum. Among 40 children of this descrip-

tion, he found tuberculosis of the intestines 16 times. The skin, also, seems to possess rather distinct resistance. Even tuberculosis inoculated from cadavers is apt to remain localized. Thus, with tuberculosis in the intestinal canal, proceeding from food, no matter whether its primary origin was in man or in animals, the outcome may be favorable or unfavorable. On the other hand, however, it appears rarely or never to lead to tuberculosis of the lungs, and in this last dictum he is in agreement with Prof. Koch.

#### STATE TUBERCULOSIS HOSPITAL.

*To the Editor of the MEDICAL NEWS:*

DEAR SIR: I write you briefly with relation to the present status of the New York State Hospital for Incipient Tuberculosis. After some considerable discussion and division of opinion as to propriety, the site at Raybrook in Essex County was selected for the Hospital. Preliminary appropriations by the legislature have permitted the Board of Trustees to purchase a site, provide for the erection of an administration building and sufficient power, water supply and equipment for the same. The appropriation was found insufficient to carry out the plans of the hospital originally contemplated, therefore it became necessary for the Board of Trustees to appeal to the present legislature for an additional appropriation, this appropriation to cover the expense of the erection of two pavilions accommodating 56 patients each, in addition to the quarters already provided for by the original appropriation. In order to make the work of the hospital effective, satisfactory or representative, it is necessary to secure the appropriation for these two additional pavilions. If such an appropriation can be secured, a model hospital for the treatment of tuberculosis can be completed representing a unit and a general plan generally conducive to the best hospital construction for the treatment of incipient tuberculosis. It is hoped by the Commission to present to the medical profession at large at an early date, a general synopsis of this plan for their consideration. The plan in so far as completed has the endorsement of a considerable number of directors of hospitals for the treatment of tuberculosis abroad and has been revised from the criticism of a number of hospital architects of this country. The general plan has many salient features which cannot be enumerated without fullest description touching upon hygienic conditions, the prevention of infection and the destruction of the immediate manifestations of the disease.

Trusting that you may be able to give notice to this matter, I am, very sincerely yours,

W. G. MACDONALD.

#### SOCIETY PROCEEDINGS.

##### NEW YORK PATHOLOGICAL SOCIETY.

*Stated Meeting, held February 11, 1903.*

**Rupture of the Aorta Due to Carcinoma of the Esophagus.**—Dr. George P. Biggs presented a specimen of rupture of the aorta due to carcinoma of the esophagus. This specimen was removed from a female, aged forty-four years. For three months prior to admission to the hospital she was unable to swallow solid food, and only small quantities of liquid. Previous to that, for a year there had been nausea and a great deal of intestinal trouble, without any vomiting. She had lost slightly in weight during the previous six months. Examination by the bougie showed fairly marked stricture of the esophagus, twelve inches from the line of the teeth. Shortly after admission, gastrostomy was performed and a bougie one-half inch in diameter

passed through the stricture from below, obstruction being first encountered  $3\frac{1}{2}$  inches from the cardiac orifice.

There was a little improvement in the power of deglutition following this, but about two months later it was again noted that there was inability to swallow anything but small quantities of liquid. The fistula into the stomach was kept open and nourishment was administered in that manner. Three months after operation, during one entire day, there were frequent small hemorrhages from the esophagus. The dressings about the abdominal wound became thoroughly saturated with blood, and the evening following a very large hemorrhage death resulted. On post-mortem examination the stomach was found greatly distended with blood. A smaller quantity of blood was found in the small intestines and in the bronchi. The growth in the esophagus was rather extensive, beginning on a level with the bifurcation of the trachea, and involving the entire circumference for a distance of eight centimeters below that point. There was apparently no marked stricture at this time, but a very extensive ulceration of the entire involved area.

A little below the center of this ulcerated area, was found a small opening leading directly into the aorta, communicating with its interior by an opening about two millimeters in diameter. The site of this communication as viewed from the aorta was further marked by a thrombus  $1\frac{1}{2}$  cm. in its greatest diameter, with a very small base of attachment near the opening.

The tumor was rather of a scirrhous type of carcinoma. A section was taken from a point not very near the perforation in order not to destroy the specimen. There was but very little inflammation, and no necrosis except very superficially. The speaker had not seen such a specimen of complete invasion of an artery of very large size by any new growth, though they were occasionally found in large veins. In no other case had he seen evidence that death was due to extensive hemorrhage following erosion of a large vessel by a new growth. Without previous knowledge of this case the final symptoms would have suggested rupture of a thoracic aneurism.

The other case about which he wished to speak was a pistol-shot wound of the skull, without any injury to the dura, but with laceration of the pia, resulting in death. The case was that of a man fifty years old, who shot himself in the upper portion of the right temporal region. The size of the ball could not be determined. It had been removed at operation. There was a depressed fracture at the point of contact of the bullet, and the man was comatose when admitted to the hospital. The bullet was found just beneath the scalp, a short distance from the point of entrance. All fractured bone was removed and the dura was found to be uninjured apparently, though no distinct pulsation was noted. The conditions did not seem to warrant further exploration. There was no material improvement after the operation, and the man died a few hours later. At the examination of the wound post mortem, the dura was found entirely uninjured, so far as any gross inspection could show. It was very tense, owing to a very large subdural hemorrhage causing marked pressure, and apparently being the immediate cause of death. In the pia, just beneath the central portion of the fractured area in the skull, was a linear tear  $1\frac{1}{2}$  cm. in length crossing one of the main branches of the middle cerebral artery. The convolution beneath this point of laceration of the pia had its normal contour, and was not damaged so far as examination of the exterior could reveal, but upon incision, a large number of small petechial hemorrhages were found in the gray

matter. The case was to the surgeons, evidently, rather unusual, as they did not think it necessary to go further after finding the dura uninjured. The blow of the bullet made a degree of pressure sufficient to tear the pia without producing any visible damage to the dura.

The third specimen was one which was of interest as a very unusual thrombosis of the left ventricle. It was from a male, aged forty-two years, who first came under observation during an attack of typical uremic coma which developed while at work. During the 69 days at the hospital, he was in a more or less comatose state. Death was expected almost any day during the entire time. The urine and general symptoms were such as to make it very clear that it was a case of contracted kidney. The autopsy revealed lesions which would make a good nucleus for a pathological museum in the way of changes more or less closely related to kidney lesions, including extensive thrombi. One of the latter was in the apex of the left ventricle. It was a pear-shaped thrombus attached by its small end to the very apex of the ventricle at two points, one of them a mere thread, the other an area of about one centimeter by one-fourth centimeter, the large end of the thrombus projecting perfectly free within the ventricle. It was of the firm, white variety and measured about  $4\frac{1}{2}$  cm. in length, and  $2\frac{1}{4}$  cm. in greatest diameter. Attached to the anterior wall of the left ventricle above the apex was another smaller thrombus 1 cm. in diameter, one-fourth cm. in thickness, which had been distinctly flattened by the larger one. One kidney, weighing  $3\frac{1}{2}$  ounces, was exhibited with the heart.

**Endocarditis.**—Dr. E. Libman presented some interesting cases of endocarditis:

**Case I. Staphylococemia in a Case of Chronic Endocarditis.**—The patient from whom the specimen was obtained was a man aged thirty-six years, who was admitted into the Mt. Sinai Hospital in Dr. Brill's service, with symptoms of aortic insufficiency and mitral stenosis. For about ten days he had had very slight temperatures; on the eleventh day the temperature rose to  $106^{\circ}$  F., and he developed petechiae on the surface of the body and on the mucous membranes. A blood culture made the following day showed the presence of the *Staphylococcus aureus* in large numbers; two days later the blood showed the same organism. The temperature continued quite high, and the man died in about twelve days after the onset of the acute symptoms. The post-mortem examination revealed an aortic insufficiency and a mitral stenosis, as had been suspected during life. There were no acute lesions of the valves except for a few very minute vegetations on the edge of the aortic flaps. On the endocardium, just below the posterior aortic flap, there was a deposit of fibrinous material measuring  $1\frac{1}{2}$  by 2 cm. in width and length, and about one-eighth inch in thickness. There were innumerable miliary abscesses in the kidneys and heart muscle, and infarctions in the kidneys and spleen; areas of acute interstitial myocarditis were also found. The cultures from the heart blood post mortem revealed *Staphylococcus aureus*, pure, and the same organism was isolated from a number of metastatic abscesses. The fibrinous-looking area on the endocardium, on microscopic examination, proved to be made up almost entirely of staphylococci. The metastatic abscesses showed staphylococci in spreads.

The point of interest about this case was that, although the case was one in which a clinical diagnosis could easily have been made of ulcerative endocarditis involving the already diseased flaps, these were found practically negative at post mortem. The case demonstrated very well the importance of being careful before making a diagnosis of ulcerative endocarditis even in

the presence of distinct physical signs of disease of the valves.

**Case II. Fatal Rupture of a Pulmonary Adhesion in a Case of Mitral and Aortic Stenosis.**—This heart came from a woman, thirty-six years of age. Several days before admission into the hospital (Dr. Brill's service) she was taken sick suddenly with pain in the right chest and went into collapse. On admission into the hospital she was almost pulseless and very pale. The clinical diagnosis was mitral stenosis, thrombosis of the auricles and effusion in the right chest. On aspirating the chest, fluid blood was obtained. It was suspected that the patient was suffering from a ruptured infarction of the lung.

The post-mortem examination revealed the following: The aortic orifice was almost completely stenosed; the mitral orifice barely admitted the end of a lead pencil; there were thrombi in the auricles; the right pleural cavity contained a large amount of blood. On the inner surface of the sixth rib there was found a firmly attached small strip of lung tissue. On careful examination it was found that there had been a firm adhesion between the lower part of the right upper lobe of the lung and the chest wall, and that the hemorrhage into the pleural cavity had come from a rupture of this adhesion. In the part of the adhesion attached to the lung was found a torn varicose branch of one of the pulmonary veins, so that, although the clinical diagnosis of thrombosis in the auricles was proven to be correct, the hemorrhage into the pleura had nothing to do with the existence of these lesions.

**Cases III and IV. Acute Endocarditis of the Aortic Valve with Perforation into the Right Auricle.**—These two hearts illustrated a special point. The first case was that of a girl, aged eighteen years, who became profoundly septic after a slight injury to the right wrist joint, resulting in osteomyelitis of the ulna. There were numerous chills followed by very high temperatures, and a marked progressive anemia. No petechiae were found anywhere. Within the course of two weeks there was developed a distinct aortic insufficiency. The first blood culture showed no organisms. In the second culture 25 cm. of blood were used, and the *Staphylococcus aureus* was found pure. It is interesting to note that the organisms were so few in the blood that they were found in only one flask of bouillon (four plates of glucose-agar had been used and three flasks of glucose-bouillon) and in this flask they were found only after three days. Dr. Libman said that he hesitated in agreeing with the clinical diagnosis of ulcerative endocarditis until the organisms had been found in the blood, because in cases of acute ulcerative endocarditis he had always found organisms in the blood.

On post-mortem examination there was found vegetative endocarditis of both posterior flaps of the aortic valve; the infectious process had extended through the wall of the heart and there was a perforation into the right auricle just between two of the flaps of the tricuspid valve; there were firm vegetations around the place of perforation. The extension into the auricle had started from the posterior inferior part of the right sinus of Valsalva. The heart blood, post mortem, was found to contain a pure culture of *Staphylococcus aureus* and staphylococci were found in the spreads made from the vegetations.

The fourth heart is from a woman, aged thirty-two years, whose symptoms were those typical of ulcerative endocarditis. There was present an aortic insufficiency and mitral stenosis. There is a marked vegetative endocarditis involving the aortic valve, and a perforation into the right auricle in the same position as in the third heart. In this case the strepto-

coccus was cultivated from the blood during life and post mortem. These two cases should properly be classed as endomyocarditis, for the myocardium is as much involved as the valve. They illustrate very well a point recently made by Krauss. In a recent article in the *Berlin. klin. Wochenschrift* he pointed out that the right sinus of Valsalva is a *locus minoris resistentiae*. Aneurisms and perforations are particularly apt to occur in this sinus. Krauss points out that if the aneurismatic process involves the upper anterior part of the sinus, rupture is apt to occur into the right ventricle just at or below the origin of the pulmonary artery, but if the aneurismatic process involves the posterior inferior part of the sinus, the perforation is apt to occur into the right ventricle just beneath the tricuspid valve in the situation of the so-called pars membranacea of the septum, or into the right auricle between two of the flaps of the tricuspid valve. The speaker said that he had brought with him a heart which he showed to the Society two years ago, which showed a compression of the conus of the pulmonary artery, due to the inflammatory swelling in the septum secondary to an ulcerative endocarditis of the aortic flaps and the sinuses of Valsalva. In this case the most marked ulceration was found in the upper anterior part of the right sinus of Valsalva.

Dr. Ewing said that he had been very much interested and surprised to find in such a considerable proportion of the cases staphylococci appearing as causes of the lesions. In his experience in examining blood in cases of bacterial endocarditis, he had found the streptococcus and never the staphylococcus. He asked whether the cultures were made before or after death. If before death, how long before, and if they had not been obtained before death—say twenty-four hours—what relation Dr. Libman regarded that they must have with the lesion itself, and how they were to be separated from secondary infections.

Dr. C. W. Field said that at the Presbyterian Hospital they had found that the blood cultures taken by the House Staff showed contaminations in about fifty per cent. of the tubes which showed any growth. In spite of careful asepsis, contaminations will occur. Dr. Tuttle threw out any case in which he found staphylococci. In many cases some staphylococci from the skin were found. Dr. Field thought that in the last case in which one staphylococcus was found in 25 c.cm. the organism could have been obtained from the skin.

Dr. Libman said that in his opinion there was no question about the bacteriological findings in the cases which he had described. He did not consider it difficult to avoid contamination of the cultures if one had had experience. The patient from whose blood he had made two cultures was profoundly septic at the time of admission to the hospital, so that the question of infection from taking a culture did not need to be considered. The *Staphylococcus pyogenes aureus* was an organism concerning the presence or absence of which there could be no doubt if all the staphylococci that were found in the cultures were carefully examined. He wished to draw attention to the fact that one must be careful in reporting the presence of streptococci in the blood, for the reason that there are contaminating organisms which grow on media without sugar, like ordinary streptococci. On sugar media they could be readily distinguished as they formed large mucoid colonies. The two organisms of this group which he had seen were negative to Gram.

Dr. F. C. Wood said that he felt that he must defend the pathological internes at St. Luke's, for in comparison to the results of the staff at the Presbyterian contaminations were exceedingly rare with them. Their

trouble was that they did not get any growth in a considerable number of cases from which one naturally expected to obtain some organisms. The cultures remained sterile and rarely showed contaminations. The system, which was in use at St. Luke's, was to plant a large series of broth tubes or flasks and then plate from these later.

Dr. W. H. Park said he thought one thing should be remembered: that where cultures were made continuously by experienced observers like Dr. Libman, the results were more reliable than when made by hospital internes. He had had considerable experience in making blood cultures in malignant endocarditis. In nearly all cases the organisms found were streptococci. He had been afraid to consider that staphylococci came from the blood if they appeared in one flask only, when several were inoculated, for fear that the growth might have been due to skin infection.

Dr. G. P. Biggs said that in septic cases at the New York Hospital they had had no particular trouble in getting positive results from blood cultures, but had found the streptococci much more frequently than staphylococci. He desired to commend the work of the House Staff in making these cultures. Thorough precautions were taken and contaminations were very few.

Dr. Libman said he believed that he had stated in the description of the first case that the blood culture was made twelve days ante mortem and was repeated ten days ante mortem, and that the same organisms which were found at that time were found in the heart blood post mortem and in spreads made from the surface of the endocardium and from the metastases. A specimen which he had to show under the microscope showed very beautifully that the fibrinous area on the heart walls consisted entirely of staphylococci. In the last case which he had reported the streptococci were found in the blood one month ante mortem and twice on later occasions. He had made blood cultures in over 350 cases of septic conditions (this did not include cases of typhoid fever or pneumonia) and in all cases in which he had found organisms present in the blood he had found the same organism present in the primary focus in the case, or in the metastases, or in both; often the same organism was found in the urine, so that there was no doubt about the validity of any of the results in the cases reported. Dr. Libman said that he had frequently found the *Staphylococcus aureus* in the circulating blood; there was no reason why it should not be found as well as the streptococcus. In only one case had he found the *Staphylococcus albus* in the blood. This was in a case of endocarditis which he had showed to the Society two years before. In that case numerous colonies had been obtained, and the spreads which had been made from the inflammatory swelling in the septum of the heart post mortem, showed innumerable staphylococci. The culture from the swelling showed the *Staphylococcus albus*. He believed that at that time he might very well have been dealing with the *Staphylococcus aureus* because he had not then made it a point to test with sufficient care all organisms which looked like the *Staphylococcus albus*. In the last four years he had not come across a case in which he could ascribe a systemic sepsis to the *Staphylococcus albus*. The finding of the *Staphylococcus aureus*, however, if blood cultures were made properly, was of just as much significance as finding a streptococcus. In a number of cases they had found that the organisms often did not persist for a long time in the blood, they settled in various parts of the body and formed metastases. In some cases of endocarditis, however, they had found streptococci in the blood repeatedly. In three cases they had found them frequently during the course of

several months; two of these cases had left the hospital with slight temperatures. One had died and examination showed endocarditis of the left auricle: streptococci were found in the heart blood.

Dr. Field asked who took the blood cultures, and whether they were taken by the members of the House Staff.

Dr. Libman said they were nearly all taken by himself. He had had only two members of the House Staff take them in the last three years. They gained experience for a month or two on cases from which no organisms were expected. After they had obtained sterile results in such cases they were allowed to take blood cultures, which Dr. Libman was willing to count in his statistics. Only those men who had already done some work in bacteriology were permitted to make the cultures. If a man could not obtain cultures without contaminations Dr. Libman said he would not be willing to have him take one in a case which he was anxious to include in his studies. The blood cultures in the cases which he had reported had all been made by himself.

In reply to Dr. Park, Dr. Libman said he was rather surprised that there should be any doubt as to the finding of the *Staphylococcus aureus* in the cases which he had reported. As he had stated before he had no difficulty in finding staphylococci and in confirming his results. He had not found the *Staphylococcus albus* as a contamination on his plates. He had occasionally got colonies of ordinary molds or organisms which could at once be recognized as being non-pathogenic organisms, but these were generally found after the flasks had been examined once or twice. He felt so sure of a systemic infection by the *Staphylococcus aureus* when he obtained it in his blood cultures that he had recently been willing to state that there was a systemic infection by the *Staphylococcus aureus* in a case in which he had found only one colony on the plates where five cm. of blood had been used. This blood was obtained from a man who presented signs of severe sepsis, which developed shortly after he had had a slight infection on his foot. The day after he had reported that the sepsis was due to the *Staphylococcus aureus*, Dr. Libman said, several intramuscular metastases were opened and the *Staphylococcus aureus* was found in spreads and cultures. The man was operated upon several days later for a large metastatic abscess of the right kidney, and the same organism was found. Dr. Libman thought this case demonstrated very well the fact that the *Staphylococcus aureus* could be found in blood cultures, and that the findings could be relied upon.

**Differentiation of Monkey from Human Blood by the Serum Test.**—Dr. James Ewing presented some observations on this subject. At a previous meeting of the Society the speaker had given the results of some experiments which tended to show that to get any specific result in the differentiation of animal bloods by the precipitation of albumins by specific antisera, one must consider not only the dilution of the blood to be tested, but even more carefully the dilution of the test serum. In those experiments it had been shown that in dealing with a very active beef-rabbit serum, one could obtain precipitates with quite a variety of bloods other than beef, if the test serum was not diluted more than one to five. When, however, the beef-rabbit serum had been diluted one to thirty, only beef and goat blood reacted, while at the dilution of one to fifty goat blood failed to react, and beef blood still gave a prompt precipitate. The dilution of the blood to be tested, if under one to five hundred, made comparatively little difference. These results were very similar to those obtained previously with the same

method by Kister and Wolff (*Zeitsch. f. Hygiene*, Bd. 41); but quite different in some minor respects. Since then Dr. Ewing had attempted to see to what extent monkey blood of various accessible types reacted to humanized sera. For this purpose he had obtained blood serum from four monkeys representing three different breeds, and had tested these sera with four different strains of humanized sera. The monkeys tested were two Java, one *Rhesus*, and one baboon, whose full generic term Dr. Ewing could not give. The test sera used were two rabbit sera, called No. 1 and No. 2, which had been prepared by Dr. Strauss in the Cornell Laboratory; one rabbit serum, called No. 3, prepared by Dr. Payne in the laboratory of the Department of Health; and one chicken serum, called No. 4, which Dr. Ewing himself had prepared. He wished to express his indebtedness to these gentlemen for the supply of these sera. The strength of the sera could be indicated in various ways, perhaps best by the highest dilution in which they had yielded a flocculent precipitate in human blood, diluted one to fifty or one to one hundred, within three hours or less. The following sera gave precipitates in one month old human serum:

TEST-SERUM	DILUTION OF TESTED SERUM	DILUTION OF TEST-SERUM	TIME
No. 1	1-100	1-50	30 minutes
No. 2	1-100	1-50	3 hours
No. 3	1-100	1-200	1 hour
No. 4	1-100	1-50	1½ hours

Serum No. 3 (Dr. Payne's) had proved extremely active, having given an instantaneous turbidity when added in a dilution of 1 to 100 to human serum diluted 1 to 100. Serum No. 4 (chicken serum) was distinctly more active than No. 1 or No. 2. The results, with the use of these sera on monkey serum, were briefly as follows:

1. *Baboon Serum*.—In all dilutions of test sera Nos. 1, 2 and 3, up to and including one to thirty, the baboon serum gave flocculent precipitates or turbidities within three hours, which were indistinguishable from many reactions encountered in testing known human blood. This was specially true with serum No. 3, which precipitated baboon serum about as actively as human, up to one to twenty, and gave a very slight, flocculent precipitate in three hours, when added in dilutions of one to forty to baboon serum diluted one to two hundred. These precipitates were, however, much less marked than in the corresponding human controls. Even with the active serum No. 3, baboon blood in any dilution failed to yield a flocculent precipitate in three hours when the test serum was diluted one to fifty. The reactions with sera Nos. 1 and 2 were less marked, and the pronounced turbidities occurring usually failed to become flocculent in three hours.

2. *Rhesus Serum*.—The reactions with this serum were almost identical with those obtained with the baboon. Sera Nos. 1 and 2 failed to give flocculent precipitates in any but the earlier dilutions (1-10, 1-20) within three hours, although causing prompt and distinct turbidities. Serum No. 3, however, gave abundant flocculent precipitates in three hours or less, up to dilutions of the test serum one to forty, beyond which the turbidities failed to become flocculent in three hours plus. The dilution of the monkey serum if not beyond one to two hundred made very little difference in the results.

3. *Java Serum*.—This serum reacted more like human blood than did any of the others. With serum No. 1 it gave distinct turbidities up to a dilution of test serum one to forty, but the turbidities failed to become flocculent. With serum No. 3 a flocculent precipitate was obtained in ninety minutes, tested serum one to one hundred, test serum one to eighty. With test serum one to one hundred distinct turbidities occurred promptly, but failed to become flocculent. With test serum one to two hundred all trace of reaction failed, although in the human control a flocculent precipitate occurred in one hour.

From the results with these humanized rabbit sera it appeared to be possible to distinguish from human blood that of certain monkeys by using high dilutions of test sera, the strength of which had been accurately calibrated. The strong sera No. 3 gave the most satisfactory results, since in high dilutions (1 to 100, 1 to 200) it failed to react with monkey blood, while still actively precipitating albumins of human blood. With all lowered dilutions, however, this serum gave turbidities or precipitates in both bloods which would not permit the separation of the monkey from the human. The suggestion arose that an animal more distantly removed from man might yield a more selective serum. An ordinary hen was therefore treated with six intraperitoneal injections of ten c.c. defibrinated blood, at intervals of two to three days. Last injection February 5; serum drawn February 9. This animal did not react to these injections by any visible symptoms. Its serum, previously inert, was found to precipitate the above specimen of old human serum rather actively as shown in the table. When tested on Java and *Rhesus* serum it failed to give a flocculent precipitate in eighteen hours in any dilution, and gave only the very faintest turbidities in the earliest dilution (1 to 10) beyond which the monkey serum remained clear till developing bacterial growth. This single experiment did not, of course, demonstrate that all humanized chicken sera would prove so selective, and Dr. Ewing had not had time to repeat the experiments with other chickens. In any event it would seem that the chicken might be recommended for this class of experiments. It was easily handled, was cheap, received injections without apparent reaction, yielded blood freely from superficial veins in the wing, stood hemorrhage well, and was apparently immune to most ordinary infections. Dr. Ewing concluded from the experiments that monkey blood could be separated from human blood under suitable conditions. One must know accurately the strength of the test serum used. The stronger the serum the greater was the danger of confusing monkey with human blood in slight dilutions were used, while with high dilutions the strong sera yielded flocculent precipitates long after monkey blood had ceased to react. Very strong serum must be diluted, at least one to one hundred, better one to two hundred, and confidence should be placed only in flocculent precipitates occurring within three hours or with a certain promptness. Humanized chicken serum seemed to be extremely selective for human blood and showed less antagonism than humanized rabbit serum against monkey blood.

Dr. W. H. Park said he did not understand the necessity of using a dilution of one part of albumin or serum to one hundred of normal salt solution in order to get a complete reaction. If a series of tubes were arranged containing 0.1 per cent., 1 per cent., 5 per cent., and 10 per cent. of serum, and the solution of precipitin was gradually added there was found first a precipitate in the 0.1 per cent., and then in the 1 per cent. solution. If a stop was made there, little change was found in the 5 per cent. and 10 per cent. solutions. If, however, as much

more precipitin was added as there was substance to be precipitated, as complete a reaction was obtained in the 5 per cent. or 10 per cent. solutions as in the one per cent. with five or ten times as much precipitate. An amount of precipitin much too little to influence all of the albumin in solution did not completely act on a small portion, but acted a little on all so that little effect was manifest.

Dr. Harlow Brooks said that he thought Dr. Ewing's work was of the greatest importance, since it promised to throw some light on the ever interesting question of evolution and might assist very materially in determining more accurately the position which the various animals really occupied in their relation to man. He did object, however, to the text of Dr. Ewing's conclusions since he stated that the blood of monkeys could be definitely distinguished from the human, and based his conclusions on the results of his experiments which had been conducted with the lower members of the monkey family only. No one doubted but that there was a very wide space intervening between man and these lower types of the primates. Huxley had showed long ago that fully as wide a space existed anatomically and mentally between the lower primates and the apes as between the apes and man. Dr. Ewing might about as well have compared the blood of man with that of the dog family as with that of the baboon. The crucial test was to make such experiments with the blood of the highest primates, and only after Dr. Ewing had shown that a marked difference existed between the blood of these animals, and man would be justified in making so sweeping a conclusion as he had given. Dr. Brooks ventured to predict that Dr. Ewing would find an even wider variance between the sera of the orang and the lemurs than between that of man and the orang. The question could not be considered as settled until such determinations had been made.

Dr. Charles Norris thought that Dr. Brooks' point was well taken for Nuttall and Grünbaum had not been able to distinguish the blood of the higher monkeys, the primates, from human blood by the precipitin test. With the blood of other species of monkeys differences had been noted.

Dr. Dinkelspiel said he thought the results obtained by Dr. Ewing spoke for themselves. By calibrating the dilutions he had derived from them a method of separation of monkey blood from human blood, a consideration which was not taken up at Cambridge. They had there used pure serum and mixed it with the original blood diluted one to one hundred. He thought this was where they had made a mistake as the sera were too strong. They had used the blood of the ox, sheep and deer, and such homologous bloods as that of the apes and human blood. He thought the line on which Dr. Ewing was working was in the right direction.

Dr. F. C. Wood asked if Dr. Ewing had observed any quantitative differences between the amount of precipitate obtained in the serum of healthy individuals. He had frequently found that there were considerable differences in human blood with accurate dilutions of both the blood and the precipitating serum.

Dr. Ewing, in answer to Dr. Park's question as to why the chicken gave such a selective serum, said that it would appear reasonable to suppose that this selective quality had resulted from the failure of the injections to excite any great disturbance of the viscera. Rabbits showed considerable disturbance, pain, restlessness, increased micturition, etc., after injections of beef and human blood, and these disturbances were probably accompanied by the production of various peculiar products of metabolism which might have interfered with the selective action of blood precipitins. The

chicken showed no disturbance whatever that he could detect and it developed a very specific serum. Or the result might have depended upon the very distant removal of the chicken from man. In answer to Dr. Wood's question, he said that he had not found any great difference in the reaction given by various specimens of fresh human blood; but old specimens had seemed to react less promptly. Greater differences arose from the age of the test serum. Dr. Norris had referred to the well-known work of Nuttall and Dinkelspiel, and of Grünbaum, who had found great similarity in serum reactions between monkey and human blood. He did not remember from any of their publications that they had used carefully calibrated sera in increasing dilutions after the method first employed by Kister and Wolff, and on which alone the results of the present work depended. Doubtless he had not seen some articles which others had encountered, but he knew of no previous attempt to distinguish monkey from human blood by this particular method. Dr. Brooks had pointed out very opportunely the limitations of the present set of experiments, and had shown that they could apply with certainty only to the lower monkeys. He had realized this limitation and did not claim to have determined as a fact that any monkey blood whatever could be separated from the human blood by this method, but only that of the baboon, Rhesus, and Java monkeys. He had not been able to secure any blood from the higher anthropoid monkeys. Perhaps Dr. Brooks could furnish such specimens through his official connection with the Zoological Garden. There was, however, a great difference in the comparison of lower monkey blood with human, and dog blood with human. Dog blood could hardly be confused in the test with human blood, while monkey blood was separated with difficulty and only by high dilutions of serum. The lower monkeys might appear to zoologists to be as far away from the anthropoid monkeys as was the dog from the lower monkeys, but there was not room enough in the scale of serum reactions for an equal difference to exist between the bloods of high and low monkeys. Hence he felt rather confident that the blood of the anthropoid apes would be found separable from human blood by calibrated serum. He would anticipate no greater difficulty in this than was encountered in separating beef, and sheep by beef-rabbit serum, as the beef and sheep were probably as closely related as were the man and ape.

**The Results of Intravenous Injections of Dilute Formalin Solution Into Septicemic Rabbits.**—Dr. L. B. Goldhorn presented some observations on the morphological changes in the blood of rabbits into which formalin had been injected intravenously. He said that he found that changes were present in the granules of the leucocytes and that the relative percentages of the different forms remained rather constant, but that an anemia invariably developed after formalin injections. The degree of the anemia depended upon the amount and strength of the solution injected. It evidenced itself by an increase in the polychromatophilic cells, by the presence of poikilocytes, and by enucleated red cells. In one rabbit which received an injection of ten c.c. of one to five thousand formalin dissolved in water, and four days later, five c.c. of one to ten formalin, anemia was very marked and there was a polynuclear leucocytosis. The lymphocytes showed the phenomena of nuclear division. This rabbit died about one month later and during this time exhibited loss of coordination and a heightening of the reflexes. One rabbit, which showed a high percentage of lymphocytes, was autopsied and found to have an extensive coccidiosis of the liver, besides considerable ascites.

## NEW YORK ACADEMY OF MEDICINE.

## SECTION ON ORTHOPEDIC SURGERY.

*Stated Meeting held February 20, 1903.*

T. Halsted Myers, M.D., in the Chair.

**Hip-joint Disease.**—Dr. Ely presented a case of cured congenital dislocation of hip, that had been under treatment for the last two years. The child, five and a half years old, was operated on April 28, 1901; she had the usual symptoms, and had an inch and three-quarters shortening, and the operation was very difficult. It took about two hours. The first plaster was on about six months; the next one for about three months. The last spica was removed in November, 1902, making about eighteen months in plaster of Paris. She now has legs of the same length exactly, and can run and hop with either leg. Dr. Lorenz took the leg operated upon for the normal one.

Dr. Homer Gibney presented a case of cured hip disease, which had been under treatment for the past two years. Within three weeks the brace had been removed and a plaster spica put on, which goes down to the knee. All the symptoms have subsided. The last examination showed that the flexion was almost normal, but to guard against any injury, when all acute symptoms have subsided and the child can flex and abduct the limb almost normally, a spica was adopted. The next procedure will be to put on a high shoe, and then the child is discharged as cured.

After the children have worn splints for two or three years, sometimes they are sent away from the hospital and allowed to take the apparatus off at night and sleep without it. The mother comes and reports that the child has no pain and no discomfort. Then the child is allowed to take off the brace by day. Lately this method was adopted.

**Rheumatoid Arthritis.**—Dr. Whitman has asked five patients with rheumatoid arthritis to come here to-night, and there are two in the hospital he might have brought. This first girl is now twenty-five years old; her right arm is helpless and perfectly stiff; she had a certain amount of stiffness in the left arm and stiffness in the shoulder. She was worse at one time than this little boy, the second case, who is now about the same as she was when we began her treatment. This shows the characteristic appearances—the thickening of the wrists and the inability to extend the fingers. He was interested to hear the mother say the child had had no treatment whatever except what she described as "exercise and nourishing food." This little girl, the third case, was brought to him about a year and a half ago, at the age of one year. She began to have this painful condition of the knee. She was taken to the hospital and was treated at first for a tuberculous disease of the knee. That treatment was apparently successful until our attention was directed to the fact that the trouble had appeared in the other knee; then it came in the elbows, hands and wrists, as you see here. The child was in a very bad condition, and then it had the measles, and, as sometimes happens, the contagious disease apparently cured her of the other trouble—she was almost well, except for this shoulder, but then she gradually relapsed again. After a time she had electricity applied—the wave current, not the spark current. The immediate effect of this was very favorable, and he has noticed it in a number of instances. The pain disappeared and the disease was apparently checked. Now she has had no treatment for three months and the improvement, so far as pain is concerned, has continued. Of course, no one would think of calling this child well—but she is certainly a great deal better.

**Pott's Disease.**—Dr. Townsend presented a case of Pott's disease, abscess and paraplegia. This little girl is seven years old, brought to the Hospital for Ruptured and Crippled seven months ago. At that time a small kyphos had appeared, and the mother was instructed to bring the child back for treatment; but she failed to return. When the child was again brought to the hospital paraplegia was complete, her respiration was very much increased and signs of tuberculosis, in addition to Pott's disease, had developed. It is stated to have followed a distinct attack of pneumonia; with severe pain in the side and marked cough. The rapidity with which the disease has progressed is interesting, and an abscess has formed in front of the spine. The abscess is probably outside the vertebral canal; it may press somewhat upon the lung. He would like to ask the opinion of the Section, what operative procedure, if any, they would advise in a case of this kind?

Dr. Sayre thought it would be wise to explore that abscess; it seemed to him it did go around the spine.

It looked to Dr. Virgil Gibney like a mediastinal abscess.

Dr. Goldthwaite thought the safer procedure for the child would be to explore the abscess. It seemed to him to be possible that it may communicate with the posterior mediastinum, and by getting rid of it one might get rid of the irritation that causes the child to cough, and she would be relieved. Of course, the opening of the mediastinum is a good deal of an operation, but it seemed to him not impossible.

Dr. Ely said that if it were his case he would let it alone; it struck him it would be unwise to operate on it. It seemed to him that the child is more comfortable when lying on its back.

Dr. Homer Gibney said the method of keeping children on their backs has been shown here a number of times; he found he could keep them on a frame.

Dr. Townsend said it was a case where the parent did not realize the gravity of the case. As matters are growing steadily worse, perhaps the mother will feel that the doctor's advice is proper, and will carry it out, but they cannot compel these people to come into the hospital nor get the child under treatment.

Dr. Myers said it is not proven in this case that the symptoms are due to the abscess. Pain and reflex spasm may cause them. Unless the child has a marked temperature or leucocytosis, showing secondary infection, he would rather, for a time, put it in some protective apparatus. The mere drainage of the abscess would do very little good. It is now pointing posteriorly, and will open there spontaneously soon. Meanwhile the traumatism and pain of daily dressings are avoided, and a brace more conveniently applied.

Dr. Goldthwaite remarked that he reported four cases of posterior mediastinal abscess. Three died suddenly in a paroxysm of dyspnea. In one case he operated on the patient during such a paroxysm and succeeded in draining the abscess. She is wearing a brace now. It seemed to him that that would be an indication, more than anything else, for the operation. The diagnosis has to be made of the child's condition from the character of her breathing. Here one has a rapidly increasing abscess. It shows plainly in the back, and it probably comes from in front of the spine.

Dr. Virgil Gibney said that about two weeks ago they had a case of this kind. They had the child in a jacket. It had a sinus in the neck which was discharging a little; they had to take the jacket off one day, and put on a swing. They made an opening in one side. The child began to collapse very rapidly and, he thinks, within a very short time it died. It went down quite suddenly, and the autopsy showed that there was a large vertebral mediastinal abscess that had

broken into the canal, and that produced the collapse. The posterior mediastinal abscess was draining imperfectly, and that closed the canal, or nearly closed it.

Dr. Townsend said he had had one case in private practice where the patient died instantly. He held a post mortem and found it was a posterior mediastinal abscess. In this case he would follow the advice of Dr. Goldthwaite and others.

Dr. Sayre said he had a similar case; the child looked out of the window, and said good-bye to its father, and by the time the father had gone a block, the child was dead.

The paper of the evening was then read by Dr. Royal Whitman: "A Report of Final Results in Two Cases of Polyarthritis in Children, of the Type First Described by Still."

Dr. Whitman also submitted several photographs of the cases described in his paper.

The cases were in leg, aged respectively five and twelve years of age.

In each case the onset was gradual and the process was for a time confined to a knee-joint, the symptoms of pain and stiffness being mistaken for tuberculous disease. After a time practically all the joints became involved. There was accompanying extreme emaciation, general hyperplasia of the lymphatic glands, and enlargement of the liver and spleen. Several joints were explored and the process was found to consist in a transformation of the synovial membrane into what resembled granulated tissue. This spread in a pannus growth over the margins of the articular cartilages, eroding and destroying it. The younger patient recovered completely after an illness of about two years. The elder died at the end of about  $3\frac{1}{2}$  years. In this case even the joints of the fingers and toes were involved. In both cases the spine remained free from disease. In the case that came to autopsy the internal organs and even the mesenteric glands showed advanced amyloid change. The joints presented the same appearance as at operation. The cortical substance of the bone and the cartilage was extremely thin. The spongy tissue was dark-red in color, but firm and regular in structure.

Dr. Goldthwaite was highly gratified, and it gave him much satisfaction to have Dr. Whitman present this paper to-night; it seemed to him that it opens up for their consideration the large field of non-tuberculous bone-joint diseases, about which there is the most pathetic ignorance at the present time in the general profession, and the solution of which comes back very largely upon the orthopedic surgeon, because such diseases can only be studied in the hands of men who have a chance to form definite clinical pictures and to study the pathology which a general practitioner misses, and the fact that men are becoming aroused to this is a matter of great satisfaction.

The differentiation of the types of this disease, in the first place, and the etiology of these cases, in the second place, are problems which cannot be solved at once, and no one man can solve them. It means the work of a great many observers—it means the pathologist, the chemist and the bacteriologist, working in their laboratories—so results are balanced and studied in proper proportions. It is perfectly apparent, in the work which they have been doing, that there are distinct types of these diseases. He should say there are four types, which is as far as they had gone with their definite clinical and pathological picture. There are undoubtedly other types mixed up in those, which they do not yet understand.

The two types, which are perhaps the most striking at first, are the types designated as rheumatoid arthritis and osteo-arthritis.

The first is a disease which comes on insidiously, takes one or two joints at first, in the hand or in the foot, the process lasting sometimes many years until a person is badly crippled. It is a progressive disease which does not kill of itself, but cripples, and it is a type which fills the beds in our almshouses. Primarily it begins with a swelling of the joint structures—not "inflammation" as the pathologist uses the term. It is more the atrophic type of swelling. With the swelling there is almost always an atrophy of the cartilage, which is followed by atrophy of the bone. Coincidentally with the process of healing in some of the joints, after the stage of atrophy is past, there may be a fresh onset of the disease in another part of the body, as may be true in tuberculosis.

Dr. Goldthwaite here exhibited a large number of microscopic specimens showing the bone changes. Surprisingly enough there is no secondary anemia as in all cases of tuberculous diseases, nor the anemia of a septic process. The glands are not enlarged, nor the liver and spleen, apparently. The next type is osteo-arthritis. There is hypertrophy of the edges of the cartilage, with a marked atrophy of the central portion. Photographs showing a condition of hypertrophy from the start, were shown by him. That is a disease which attacks a great many joints, but it is not a progressive disease necessarily, while the so-called rheumatoid disease is.

Then there is another puzzling type which has come to be observed more or less recently, which was designated, for want of a better term, toxemic—a group of cases which sometimes comes from traceable causes, and at others from no apparent cause. The X-rays which one gets from these cases are different from those in the rheumatoid condition, and there is an enlargement of the glands, spleen and liver, which shows anemia, or sepsis of the joints—any number of joints may be involved. He made a diagnosis of a case of toxemic arthritis where the patient died. The autopsy showed the characteristic features of this disease, and it seemed to him that the condition described by Still comes better under that class than any other. It is a condition which is not confined at all to childhood. One may have the same type in adults as in children. One case he observed in a child who had a tooth filled. A very strong, robust child. Following that the child ran down rapidly, developed joint symptoms, and to-day presents all the appearances described by Still. The knees are affected and the neck is affected. He has seen the same thing in other cases, starting in at one joint and then involving others, and in one case we got a culture from the throat. The process went on of the same type as we have described as toxemic arthritis.

The differentiation between that and rheumatoid is a matter of a good deal of importance, and it is somewhat difficult. Dr. Whitman has reported one which should be placed in that class. The cases may go on a long time. Many get well, and frequently without treatment. So, as a matter of prognosis differentiation is important.

There is the other type—that is, pure gout, chronic gout. There is usually a pure deposit of uric soda about the joints, as shown by chemical analysis. In these cases, however, there is not simply an atrophic condition, but a destruction of the bone, as he thinks he can show in the X-ray photograph, in which one of the joints has almost entirely disappeared. He has a series of X-rays, together with plaster casts here, which will make the condition clearer, showing the typical swelling and appearance of the wrists and arms.

Dr. Sayre said he was very much interested in these papers. It is a subject of which he is extremely

ignorant, although he has been watching a number of these cases for several years, one since 1886. In one he excised the bone. The chief difficulty was in a case year before last—a small child. There was this great neurotic tendency paraplegial neuritis and neurotic disturbances of the circulation; also this ecchymosis which you see in certain nervous affections, in various parts of the body, which disappears quite rapidly at times. The case was much relieved by the application of electricity. It seems in several of these patients to be very largely a question of diet, in regard to the improvement of the condition of their joints. In what way the assimilation is defective he had not been able to determine. There is also very defective excretion. He has been unable to classify these cases, and he has listened with great pleasure to Dr. Goldthwaite's diagnosis and Dr. Whitman's paper on the subject. In one case—he has not seen it in almost two years—which he had under his observation for a while, the child was brought back to him a short time ago by its father well, with the exception of one joint. It surprised him greatly. He does not know why it got well.

Dr. Townsend said the first cases reported by Dr. Whitman interested him very much. He remembers some seven or eight years ago reading a monograph on a case of rheumatoid arthritis. He thinks that Dr. Whitman said he had found only twelve cases in several years. He is sure they see that number every year at the Hospital for Ruptured and Crippled.

Dr. Whitman said he is particularly interested in the cases he has presented. He would call particular attention first to the fact that the disease is accompanied by a destruction of the cartilage, and second that a stiffness of the spine is not always one of the early symptoms. These two patients went on to the end without any affection of the spine. Some of Still's cases are cases of what we may call rheumatoid arthritis. Dr. Townsend spoke of a case he had six or seven years ago, where the patient is now very much improved. It is really interesting to see how these cases of pure rheumatoid arthritis, with no treatment whatever, except the protection that the hospital affords, may be cured.

Dr. Whitman said he was much interested in Dr. Goldthwaite's remarks on this subject; but he does not know whether he should class them on the toxic side or not. He should say, however, that in both of these cases the disease is confined to one joint. He is inclined to think that the symptoms are rather too slow in appearing, because in the first case the patient had this affection for months before the general affection of the joints.

Dr. Goldthwaite said he does not mean to give the impression that in the so-called toxic type the joints became involved all at once. He meant in a comparatively few months, and new joints were not invaded. In severe cases all the joints may be involved; but he has seen cases where only one or two joints were affected. He has omitted entirely any reference to the treatment, because that is too much to undertake in a discussion of this kind; but in almost all these cases one can make the degree of crippling less by careful treatment. In many cases one can get persons onto their feet, not walking normally, of course, but so they can get around their room.

Dr. Balseley presented his apparatus for taking casts of feet for flatfoot plates. A four-inch wide band of sheet steel or lead is bent to conform very loosely to the lateral outline of foot and ankle. A removable piece of board fits inside this. A four-inch roller bandage closes the outlet at the ankle. The foot is now placed in the box so formed, the external malleolus resting on the roller bandage supports the foot steadily,

while the plaster is poured around it and the casts taken in the usual way. As the board is removable the apparatus can be used for either foot by simply turning it over, always keeping the board at the bottom.

## BOOK REVIEWS.

**DISEASES OF THE SKIN.** By H. RADCLIFFE CROCKER, M.D., Lond. F.R.C.P. Third Edition. P. Blakiston's Son & Co., Philadelphia.

CROCKER's book on diseases of the skin needs no trumpeting from the house-tops. Its merits have long been recognized and it stands to-day as the ablest exponent of British dermatology.

Believing, as we do, that, in diseases of the skin, there is nothing as helpful as copious illustration, the book falls behind many of our more modern treatises in its lack in this feature. It is to be hoped that in a future edition the author and publisher will bear this in mind, and thus bring what is one of the very best texts on the subject of dermatology, by means of well-chosen illustrations, into the front rank of works devoted to this specialty.

**UEBER DAS PATHOLOGISCHE BEI NIETZSCHE.** By Dr. P. J. MÖBIUS. J. F. Bergmann, Wiesbaden. Lemcke & Buechner, New York.

THE life of this interesting German philosopher was full of interest and surprises and his early mental decay and ultimate death were tragic events in a living chapter of more than usual interest.

Möbius has here made a careful and, at the same time, a sympathetic study of this celebrated man. He first discusses the early life of Nietzsche, his progenitors, and his personality. He then describes and goes into the minutiae of the sickness of Nietzsche, describing in great detail his attacks of migraine and showing, by his writings, as well as from the letters of his sister, the development of his mental degeneration.

His mental disease Möbius states was general paresis, from which disease he died. The brochure which is only 106 pages in length is a most interesting one, dealing, as it does, with a master mind. It is well deserving of a wide circulation.

**THERAPEUTICS OF INFANCY AND CHILDHOOD.** By A. JACOB, M.D., LL.D. Third Edition. J. B. Lippincott, Philadelphia and London.

THE first edition of this book was published only nine years ago and the need of two revised editions since that date is ample evidence of the book's usefulness. The same attributes which have commended this work in the past still render it one of the most practical of our modern text-books.

The present revision does not depart in any essential features from the general character of those that have preceded it. As an author who has had one of the richest experiences in the treatment of diseases of children in this country, if not in the world, Dr. Jacobi's work comes with a foundation of sound and mature judgment that is often lacking in works of some of the younger generation.

There is a healthful conservatism that endears the work to many of the older generation and a scientific enthusiasm which throughout manifests the author's sympathy with the work of the newer pediatricists. It therefore, makes, we believe, one of the safest guides to the general practitioner with which we are acquainted. We trust that the author will give us many more editions.